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PUBLIC UTILITIES

JOHN A. RUSSELL

The PUBLIC UTILITIES

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FOREWORD

THE following chapters on the Public Utilities were published recently by Darby Richardson for the first time exclusively in the New York Globe. The author, Dean Russell, has been for many years a student of and an extensive writer upon these subjects.

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Public Utilities a Necessity

For the Preservation of Civilization in Cities

We hear a deal about World Reconstruction nowadays.

World Reconstruction has to do with Ideas no less than with Materials.

Before the Great World War we could all afford to be a little loose with our logic and could entertain fool ideas about persons, things and institutions.

So many things went right then that it didn't make much difference if a few went wrong. The net average of right was still pretty high.

Nowadays it is different. There is no room for lost motion, either in the business of working our heads or that of working our machines. We must think straight, act straight, work straight.

Our machines must have leveled bearings to make inspectable and salable product. Our heads must be directed by the cold logic of the situation to give a sensible slant to Public Opinion, when it affects the future prosperity and progress of our civilization.

Prosperity and Civilization depend on cities, because that is where most people live. More than half of the people of the United States live in cities nowadays—big cities and little cities, villages, towns and hamlets, from New York down to the centre with a Single Thousand Souls.

Community living has grown up from various causes. The seaports were the first, ordained to be the abiding places of sailors' wives, where they could pray and worry in concert over the safety of their husbands and sons, rejoice at their return from the seas, and weep when Jack came not home from the deep.

Then came cross-roads settlements and fur-trading posts, and the neighborhoods of military forts, and railroad junctions, and places where transportation by land met transportation by water.

And then came other settlements at points where raw materials could be most conveniently assembled, turned by labor into the necessities and luxuries of life, and distributed to consumers.

The Demand for Community Usefulnesses

All of these centres grew in population, some more, some less, and their growth brought proportional community demands. The supply brought into being the Community Usefulness. We call them Public Utilities nowadays.

The first was the Water Supply. Not everybody cared to lug water from the spring, which was often far away. So the community did its

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water-lugging by joint effort, which meant placing pumps at the spring or well or river bank, and driving the water through iron to the homes of the citizens.

There was so great a demand for these services, when several thousand communities with certain futures were growing up, that private capital could not be found to provide all of them. Private capital did construct many such services, but as a rule the entire property of the communities had to be mortgaged to find the money for water-works. Communities mortgaged? Certainly, for municipal bonds are only mortgages on all the property of the communities issuing them.

Then came demand for good illumination during the hours of darkness. The resin knot had given way to the camphene lamp, a mussy thing, with more bad smell than light. Tallow candles competed, burned in the open and with protection from the breezes. Kerosene had not then been separated from the crude petroleum.

An Englishman discovered that by distilling coal a gas was given off which could be conducted through pipes and burned from jets.

This was again a Community Usefulness, but a costly one. It involved large investments in central works and pipes beneath the streets to convey the gas to its users. It was very desirable to that part of the public that could afford to pay for it, but it was not so popular that the communities cared to mortgage all their properties anew to erect the works for themselves. So they uniformly granted rights to private investors who were willing to take the risk of supplying gas as a business. They might build gas works and lay their pipes in the streets and supply their customers and charge no more than such-and-such a price.

As communities grew over areas people had to walk long distances to work, to business, to schools, to devotions. Time had some value, effort some more. Not everybody had his horse and vehicle. Mostly everybody didn't have them. Even for those who had, the roads were bad. Then came the tram car, a sheltered platform, mounted on wheels, traversing an iron track which made it possible for horses to pull it. Where one person couldn't afford a horse and vehicle, each of the many could pay his share of the cost of the tram car service. This was another Community Usefulness, but not so attractive or promising of profit that the community would mortgage all its property to find the capital for it. By this time all the community's spare cash and credit were being used for sewers and pavements, and fire protection, and schools. So the community said again to private capital: "Take the risk, and make a profit if you can, but count us out on the risk and the loss, if loss may come." For at that time the people did not realize the need for steady increases in the investment to care for growing service demands, nor that new money would not be risked by private investors unless the original investor was paid a fair return.

The Age of Electricity

Then came the Age of Electricity. Science found out that the turning of certain masses of soft iron and coils of wire in the fields of influence of certain other coils of wire and masses of magnetized steel produced electric energy which could be carried on wires to other and distant

New York Edison Co.
Courtesy of

Thomas Russell Bradley

Modern Central Station in Manhattan

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machines and give them motion, and which would make hair-like filaments of carbon glow with more intensity than a score of tallow candles or a dozen kerosene lamps.

Everybody in every community wanted the new electric light, but not so badly that the communities would further mortgage all their properties to provide the apparatus and equipment. The Communities were not sure that it would pay. So once again they said to private capital: "You take the risk and make money if you can. If you lose, the loss is yours." Only where private capital absolutely refused to take the risk did the community invest its own money. They called that Municipal Ownership.

The energy that turned the glowing filament into a light-giver was put to giving motion to machines which would turn the wheels of street cars. That called for new capital from private sources, the junking of the old tram cars, the replacement of the old rails with heavier and costlier ones. The Community was in haste. It said to private capital: "Come on! Be sprightly! Hurry up! Give us the new way! We want Rapid Transit! We've been old-fashioned long enough! We're in desperate need!" But never in such need as to mortgage all the properties of the community to find capital for the new way. Private capital must take the risk. As in the other case it took the risk.

People began to talk of the Community Usefulnesses in general terms. They went together with Progress and Growth. Some word-juggler christened them Public Utilities—a very good name.

Public Utilities the Basis of Civilization in Cities

Through the initiative of millions of private investors they are now the basis of the Civilization that finds expression in Cities, Villages, Towns and Hamlets. The growth of these centres of human activity, great and small, has come with them. It cannot advance save as they advance. As they lag, the prosperity of the Communities lags.

In the world reconstruction of ideas the people of the cities must learn to understand that the continuance of the civilization that finds its expression in cities is altogether dependent upon Public Utilities. Every phase of human existence comes into contact with them.

Imagine any big or little city without a water supply. Conceive a city of extended area without a street railway service. Think of the possibilities of industry without electric energy. Dream of a metropolis cooking its meals without a domestic gas supply. Take electric energy and gas for the treatment of metals out of industry and how many decades is it thrown backward? Forget the telephone and try to do business. Eliminate electricity and try to operate a monumental office building. Take gas for domestic cooking out of the costly apartment building and seek to substitute other forms of fuel. Take the fan from the sickroom and the hospital in the season of summer heat. Banish the electric washing machine and go back to the rubbing-board and the washtub. Take the motors off the sewing machines and try to operate the clothing industry, the shoe industry or any department of textile manufacture. Cut off the electrical police signal system and wipe out efficient methods of protecting life and property. Cut the power from the motor-driven air compressor at the garages and go back to filling automobile tires with hand pumps.

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Stop the city street-car systems and find out how many men can earn their living within walking distance of their homes. Deprive the filament lamp of its energy and witness the passage of the "White Ways." Think a thousand other things and wonder how the world would get on without the services of the Public Utilities. They are closer than the shirt to the average man.

The Public Utilities Are Democratic

And the Public Utilities are Democratic. Every step in their perfection has been in the direction of extending and improving their service for the common people. Only the common people use street-car service, while the wealthy have private conveyances. The electric bulb glows as brightly and as cheaply in cottage and tenement as it does in the mansion. The prepayment gas meter has taken the place of the far-carried bushel of coal. The pay-station telephone puts within reach of the most casual caller, whatever his station, a service which has cost millions. The electric current drives the housewife's sewing machine with the same certainty that it operates the elevators of the Woolworth building.

**The Public Utilities Are So Close to the Common People That,
Without Them, the Civilization of Cities Must Perish from the Earth**

The Public Mind and Public Utilities

For the reason that the Public Utilities come into such intimate touch with the domestic, social, commercial and industrial life of the people, the public mind should be well informed regarding their organization, incomes, needs and possibilities.

This has not been the case in the past. Exact information having been limited, as a rule, to those engaged in their operation, those whose capital is invested in them, and those whose business it is to find new capital for their enlargement or extension.

How the Public Mind Was Misled

Heretofore a great deal of inexact information has been given the public from a variety of sources. Briefly, these may be listed as follows:

First: From the exuberant anticipation of pioneers in modern public utility practice, who thought they saw in the improvements of the various arts opportunities for *cheapened* rather than *bettered* service. This was particularly true of the pioneers in electric street railway service, and to some extent of the pioneers in modern gas practice.

Second: From the statements of unskilled promoters of certain classes of utilities, who, without accurate engineering knowledge and proper accounting practice, sought to "dress up" investments in such properties as being productive of extravagantly large incomes, frequently much greater than was necessary to attract conservative investors. This was specially true of some early converters of gas properties from old-fashioned to modern organizations.

Third: From that class of organizers who sought to set up competitive systems, and who, either from actual ignorance of operating costs and depreciation and maintenance, made promises which were not realized in actual practice. This was particularly true of promoters of independent telephone properties and municipal electric light ventures.

Fourth: From persons in public station, seeking the favor of their fellow-citizens through the medium of attack upon the investments, gross incomes and profits of utility companies, and who, with no responsibility for their statements and figures, posed as expert critics of services which touched the people in so many relations of life.

The Usefulness of Regulation

Such outgivings produced a condition of inexact information in the public mind concerning these very intimate servants of the public. Some politicians and some newspapers have made and still make the most of this condition by drawing conclusions from inexact information that are themselves quite as wrong as their basic foundations.

These conclusions have to do, generally, with the notion that, as these utilities occupy the public streets and ways, the public should influence their earnings, either by the imposition of burdensome and unequal taxes,

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or by other requirements intended to depreciate their income or dissipate it when earned.

Having discovered that no public utility can serve the public well unless it be permitted to enjoy an adequate income, regulatory laws have been passed in nearly all the states, New York and Wisconsin leading, which provide for a "live and let live" relationship between the utilities and the communities which they serve. The general principles underlying these regulations, which have been established and have the approval of experience, are as follows:

Principles Under Which Utilities Are Regulated

First, That Public Utility organizations are of their nature monopolies, and that, in return for admitting their monopolistic character, the State has a right to regulate their charges and practices, that the interests of the public may not be harmed by a condition of unrestrained monopoly.

Second, That such regulation of charges and prices shall have a two-fold result in view—namely, the prevention of excessive earnings on the capital invested and the guarantee that the earnings shall be sufficient to pay an adequate return upon the capital, after operations, maintenance of the property and provision to take up depreciation have been made.

Third, That it is not inconsistent with the public interest that the Public Utilities be permitted to earn enough to provide a reasonable surplus to enable the attraction of new capital as it is required.

Fourth, That such corporations must constantly be kept in financial and physical condition to attract such new capital, to be expended upon such extensions as are required for covering new areas with their services, or for increasing the services within the areas as originally covered.

Fifth, That no public gain accrues from the imposition of extraordinary public burdens on such companies, because the revenue to meet them must come from earnings from the public, which is, under such conditions, only taxing itself.

Sixth, That the maintenance of continuous and satisfactory service is the duty of the corporations in reciprocity for being permitted to charge rates of sufficient amount to permit the giving of such service.

Present-Day Relations with the Public

Under the application of these principles the relation of the utility companies to the public at this time has these general features:

Such public outcry against excessive capitalization as has been heard in the past has no standing.

The utilities are permitted to earn a commercial return only upon their present fair value as established by appraisals of their earlier construction and strict account of the expenditure for current periods.

Whether the gross amount of such earnings is divided over more or less authorized capital neither affects nor concerns the users of the services.

The public demand for compensation for the use of public streets and places has become illogical. If the public puts burdens on the cost of producing the service, it must itself pay them through the rates.

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The public notion that some undue advantage is taken of it, for instance, by the use of the highways for street railway purposes is now looked upon as unfounded. Street railways on public highways increase their capacity for traffic and reduce the burdens which would fall upon them were traffic restricted to pedestrians and vehicles.

The placing of Public Service property beneath the streets, as for gas, heating, electric or telephone service, does no greater wrong than the placing of water lines and sewer systems thereunder. They all serve the public convenience and none of them burden the highway.

Investments in public utilities are again conceded to be quite as worthy of honest public treatment as are investments in commercial or industrial enterprises. While they are affected with the public interest, that interest is not served either by hampering or restraining them, except in such particulars as will prevent them earning unreasonable returns from their operations.

The hue and cry against excessive investment has been pretty well shown to be unfounded. Where such excessive capitalization has existed, it is not infrequently found to be due to early expenditures called for by the rapid advance of the respective arts involved, and in these cases the gradual writing off of the capital represented is being insisted upon year by year, so that the figures of actual authorized capital and of actual fair present value of the properties are coming closer together.

The investment of new capital is being officially authorized only after its necessity is proven, and the expenditure of the proceeds of such capital is being diligently supervised by the regulatory authorities. The possibility of excessive capitalization is being made more and more remote by the new conclusions of the regulatory bodies.

Public Utilities as Community Clearing Houses

The theory that the Public Utilities are only community clearing houses for producing services in bulk rather than in unit quantities for individual supply is becoming more and more fixed, and with that fixing has come more prompt recognition of the changing prices of labor and materials entering into such services, whether these changes be downward or upward.

This condition is different from that which prevailed in the early days of regulation. Most of the original regulatory law was written in the light of experience, with continually cheapening processes. The experience of the World War period showed that Public Utilities, no less than other enterprises, were subject to the advances and declines in the prices of labor and materials, and that even cheapening processes and higher costs of production were not inconsistent with each other, when prices of labor and material went up faster than the cheapening of processes caused normal production costs to go down.

The services of Public Utility companies have come to be recognized as experiencing fluctuations in harmony with those experienced in other business operations and to require modification of rates upward and downward in harmony with such fluctuations.

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The Changed State of Public Mind

The general realization of these conditions has followed appreciation of certain facts not strange to investment and business. One of these was that capital could not be forced to go into any business which was made unattractive or unprofitable. The original investment might be imperilled, but no new money for extension could be forced in. Every public utility requires new capital annually. To attract it the money already invested must be earning a satisfactory return. The recognition of this condition has now become well-nigh universal.

The public has come to recognize the growing and extending usefulness of the services of the utilities. New uses for each of the leading forms of public service are being daily developed in domestic, commercial, social and industrial life. With the development of each new use the dependence of the public upon the utilities becomes more definite. To this dependence the utilities themselves have responded by increased efficiency in management, increased insurance against failure to function, and a better sense of relationship to the public.

The Brain Power Behind Public Utility Service

When the average person invests his money in a gold prospect, or in an oil possibility, or in the development of an invention, or even in a new industry, he makes a bet on somebody's guess that it will turn out well.

When the average user of a Public Utility Service, or the average investor in a company supplying such a service, makes use of its product or puts his money into it to get an income he has behind the service rendered, or the investment made, the genius and the research of generations.

Did it ever strike you, Gas User, Electric Light and Power Customer, Street Railway Rider or Telephone Subscriber, how much genius you get for your Dollar? Or how much of the history of invention is in the Service rendered you? Or how much romance there has been in the up-building of the service given you, on the instant, when you call for it?

Do you know how much accumulated brain power is serving you?

Did it ever strike you, investor in Public Utilities, what refinements of scientific investigation, what certainties of results, what growth of the law, what accuracy of accounting, are marshalled behind your dollars, your shares of stock, your bonds?

Do you realize how much brain power is at work keeping your investment safe and remunerative?

The Public Utilities are the results of the visions of genius, of the heartbreaking of research, of the accidental and deliberate conclusions of science, of the wonders of invention, of the faith which consumer and provider, capitalist and worker have in the American people.

What the Gas User Gets

When the ordinary user of gas turns on the supply to his lighting apparatus or his stove or range, he harks back to the time when Billy Murdock, a Scotch mechanic at Redruth, in Cornwall, discovered that anthracite coal, distilled in an iron pot, gave off a gas which, collected in bladders, could be used for a torch, and later carried through tin pipes.

He is the beneficiary of a distribution system devised and put into operation in Baltimore by Rembrandt Peale, who is more famous for having painted a portrait of General Washington than for having run a gas works.

In the service given him in any American city he is profiting by the scientific investigations of Justus von Liebig, the great German chemist, who is more famous for his "extract of beef" than for his more intricate investigations into "Town Gas."

He is enjoying the results studied out by Bunsen, who made a gas burner which would produce more intense heat.

He is using the results of the study of Welsbach, who worked for years before he hit upon just the right clay product to produce the gas

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mantles which now may be bought in any fixture or department store.

He is inheriting the benefits of the inquiries of Dr. Ludwig Mond and of the Brothers Solway, whose investigations into alkali production for soap and gas making had to be carried along with coal distillations, and who made possible the production of the by-products from coal, thus cheapening city gas.

The geniuses of the past and present, working in laboratories, figuring by night and day at desks, designing apparatus on the drafting board, are all serving him, many of them long after they are dead. And an organization of miners, railroad operatives, gas house workers and distribution superintendents are standing by, like a disciplined army, to make sure that the touch of the match to the gas supply at his lighting outlet or domestic range is resounded to by illumination for his lights or fire for the cooking of his meals.

What the Electric User Gets

When the every-day user of electric energy for light or power uses turns the switch at his lighting outlet or on his machine he has instantly at his disposal the service of the geniuses of more than half a century.

The great Thomas Edison is at his elbow, because he designed the machines which turn out the energy which enlivens his lights or turns the wheels of his machine, and because he invented the incandescent lamps, improved types of which now almost universally furnish light to the civilized world.

Nicola Tesla smiles at the results of his studies in long-distance transmission, which make it possible to carry the energy from a point of production hundreds of miles away from the point of consumption.

The shade of Charles F. Brush is behind every street lamp in the country.

Present-day service, based upon the inventions and genius of these pioneers, is made possible by the continuous research work of scientists and engineers directed by the active brains of such men as Charles P. Steinmetz.

Every workingman who works at a machine driven by an electric motor, every housewife whose sewing machine, washing machine or vacuum cleaner is operated through a wire from a lighting outlet, is profiting by the genius of Frank Sprague, a great American scientist more than thirty years ago.

Behind every domestic and mechanical use of electric energy stands the results of the work of a galaxy, living or dead, who alone would have given glory to American investigation and invention. And with every call from a lamp switch or the starting box of an electric machine there is an army of stokers, engineers, switchboard tenders, distributors and construction and repair men who respond with as much harmony, accuracy and certainty as the musicians in Sousa's Band answer the baton of their conductor.

What the Street Car User Gets

The citizen of the community served by electric street railways, or of

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the countryside which finds its travel advantages in the suburban car, is not served merely by the motorman and the conductor with whom he comes in contact. His motorman is the present-day viceroy of Charles Vondepoole, who, starting as a cabinetmaker, invented the electric engine which drives the car and applied the little trolley wheel which draws the power from the wires; of George Westinghouse, who put to work the compressed air system that operates the brakes and the car doors; of Tesla, again, and of Lamme, who made long-distance transmission possible, and whose art is applied in polyphase motors and high-tension currents that travel a hundred miles over wires little thicker than a lead pencil.

The conductor, gathering in his fare, represents the energies of promoters who attracted money to the present-day service, the conferences of capitalists considering its feasibility, and the thousands of investors whose money was charmed into the venture in transportation. For every electric transportation enterprise, great or small, these processes had to be gone through. The motorman may be Jimmy Jones or Pat Murphy or Hans Schmidt, but he stands at his post as the last-word representative of the capitalists and bankers whose assurances of safety for capital had to be given before the money that employs him was provided, and he is now in turn the realizer of their hopes and the collector of the income which their great vision foresaw.

What the Telephone User Gets

When the telephone user takes his instrument in hand he is invoking the services not only of the young lady operator who gives him immediate response, but of Reis, Bell, Edison, Gray, Blake, Berliner, and the great geniuses who made it possible to carry human speech, with increasingly greater perfection, over wires as thin as a thread of silk, across continents and under seas, and even at this day through the air.

Every telephone conversation which he undertakes replaces what forty years ago would have been the cost and effort of the journey of a messenger. For every long-distance message which he accomplishes he is saving the time, cost, delay and danger of a railroad journey of thirty years ago. When he talks across a continent, partly over wires and partly through the air, he is utilizing the engineering genius of Guglielmo Marconi and John Carty, which have made such things possible.

The Public Utility patron of this day in which we live, however humble his station or menial his occupation, is enjoying the use of facilities which neither Solomon nor the Queen of Sheba, Alexander or Cæsar, Marco Polo or Columbus, King George or Washington, Napoleon or his conquerors, Lincoln or Davis ever had at their disposal. This is not mere rhetoric. It is the logic of the facts. Because they are commonplaces they are none the less important, useful, necessary.

Behind these services are organizations more perfect than that of armies, because the need of armies is ephemeral, while the need of these services is constant. They are the basis of the functions of civilization as we know it.

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Behind them as investments there is a history of human study and investigation in all the sciences, of improvement in accuracy of performance, and of a growth in necessity that is not yet ended.

The world can never think how to live without them again. The city may get along with poor government, but it can never live without a good gas supply, a good electric supply and a good transportation service. The countryside may be parched by the drouth and the soil refuse to give forth its fruitage, but it must still have communication and transportation between it and the city.

Based upon these eternal facts of civilization, the public utilities are the best-founded investments known to the conservative investor.

An appreciative public will always pay fairly and willingly for their service. It must, else there must be a reversion to the civilization of the treadmill, the ox-cart, the pitch-torch and the courier.

The Average Person's View of the Public Utilities

The average person—not the man in big business, nor the college professor who knows so many things, nor the specialist who knows one thing better than all the rest—*makes public opinion*.

The average person is a whole lot of people, from whom the politician takes his cue, or thinks he does, and on whose views he trades for his own political success.

The average person reads the "flash" newspaper, the one whose managers think that commercial profit is to be made by setting up quarrels between class and class, which doesn't necessarily mean between rich and poor, but between producer and consumer, between buyer and seller, or between employer and employee.

The average person is of the class made up of the butcher, the baker, the candlestick maker; the King who's in his parlor counting out his money, and the Queen who's in the kitchen eating bread and honey; the hall-room boarder and the head of the family who joins the good wife in the upbringing of the family; the preacher, the lawyer, the doctor, the engineer; the worker in field and forge, in mine and factory, in the railroad cab and at the street car motor, the "cop" who paddles along his beat by day or night, the fireman, ever alert to the call of duty.

The average person earns his living by the sweat of his face or the activities of his brain, gets a wage for his work, and husbands it so that he or his family may live decently, pay his bills periodically, and have something left over for the day when it rains. Sometimes it is hard to make the wage stretch all the way round, or to have some left over.

The Making of Public Opinion

The average person wonders why the wage doesn't go farther. His wonderment has created a modern profession—that of telling him why. As the good old Yankee salesman told his mates during one of our spells of hard times, "I never see times so hard that a smart fellow couldn't make his living telling other folks why they was so hard." One says it's the stock exchange, another the grain brokers, still another the middlemen, a few the employers, some others the workers, and a whole lot of them the public utilities. So, by the process of exciting the average person against some ill that does not affect him, they produce a state of forgetfulness of the ills that really exist. The doctors call this "counter-irritation"—making one forget the pain IN his leg by keeping him busy with the blister on the outside.

One of the most popular forms of counter-irritation is to "whack it" to the public utilities, by telling the average person—let's see, just what?

First, that they are all owned by one little crowd of capitalists.

Next, that they are in a class by themselves, making product or giving service out of next to nothing, and charging almost all there is for it.

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Again, that they serve only the well-off, leaving the poorer classes to do without the benefits of the arts on which they are based.

Considering utilities as investments, these wisecracks—who rarely have a dollar of their own to invest, but who are long on advice—gravely shake their heads and are fearful of the lack of public confidence, or the possibilities of government ownership, or the unwillingness of the people to pay the rates, or of the regulating authorities to permit the rates to be charged, and all along through the gamut of pessimism. The average demagogue starts with high C and sings down to low A. Real artists usually reverse this procedure.

The average person, busy with earning his living and making his wages go the farthest, and making no pretense to grave wisdom, takes it all in, and thus sometimes Public Opinion is Made—or a part of it.

The Greatness of the Gas Utility

Does the average person ever stop to think how really great the Public Utilities are? Or does he consider how far the service he gets has to come, or how many workers speed it on its way? Or, once more, does he dream of the quantities of raw materials required to render him service, or the amount of labor necessary to transform it into just the kind of energy he uses? Let's see.

Take the gas supply, for instance. That is a service pretty generally used. More than nine million customers use gas in the United States. The average family is composed of five persons. Therefore Forty-five Millions of the One Hundred and Ten Million People in the United States use gas for lighting, heating or cooking purposes. That doesn't look like a service for a class, does it?

Gas is made from both anthracite and bituminous coal, and from oil. The gas works of the country in 1920 used 9,000,000 tons of bituminous coal and 2,000,000 tons of anthracite coal and nearly one billion gallons of oil. The eleven million tons of coal represented one and one-quarter million days of the work of the men who mined it. It made 300,000 average car-loads to be hauled by the railroads to form part of the supply of work to the endless thousands of engineers, firemen, brakemen, trackmen, dispatchers, watchmen and others who run the steam transportation lines. When laid down at the gas works all over the country, each getting its share, it required the work of 80,000 men to turn it into gas and deliver it to the user. These materials and the wages of these workers all had to be paid for, in cash, in advance, before a single penny was collected from a single customer.

The Bigness of the Capital Required

It took nearly \$4,000,000,000 of capital to build the gas works now serving the people of the United States. When figures get so big it is hard to conceive them. Their size must be measured against other big figures. The amount of money invested in American gas works is greater than the amount of any single Liberty Loan. It is greater than the national debt of the United States at the close of the Civil War. It is more than

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the assessed valuation of some of the greatest American cities. It is as much money as congress expects to collect from all the people of the United States next year to run the government, including the interest on the war debt.

There are more than one thousand manufactured-gas companies in the United States. They serve over 4,600 cities. Their product goes through more than 70,000 miles of street mains, big and little. They must have constantly in stock a million tons of coal to be sure of a 30 days' supply ahead. They must have two and a half million gallons of oil in stock for the same assurance. This is the working capital with which they provide a credit ahead for their customers before they begin to earn a penny. Collections from these earnings usually come six weeks later than the rendering of the service. So the gas-consuming reader who is interested in these figures can add 50 per cent. to them to cover the month and a half that has to pass between buying raw materials for gas making and collecting the customer's bills.

The Gas Business a Very Big Business

The gas business in the United States is a very big business. We Americans like to look at big figures. We rarely comprehend them or compare them with the little figures about the things we know and meet daily. Take, for instance, the figures of gas production. In the United States last year more than three hundred and twenty billion cubic feet of manufactured gas was made. How much gas is three hundred and twenty billion cubic feet? If it were all made and stored at once, just for one day, it would require a tank as big as the state of Rhode Island and more than 15 feet high, if it were possible to make such a tank, to hold it all. It might all be put into a tank covering the area of New York County and Kings and Queens, if the tank were over 70 feet high. But because it is made every day, in more than 1,000 gas works, spread all over the country, few of which come to any consumer's notice, it seems commonplace and ordinary.

The gas business is a big business. The people pay \$450,000,000 a year for its product. But, because 9,000,000 customers use it, the cost of gas averages the American householder less than \$50 a year. The whole people spend more money for cigarettes and soda water than they do for gas.

The Gas Business Not Owned by a Clique

The gas business is a big business, with more than \$4,000,000,000 of capital invested in it. But there are more than 400,000 investors who have their money invested in it, at least so the brokers figure, which would make an average investment of \$100,000 each. Some have more and some have less. The locomotive engineer who pilots the coal train to the gas works may earn part of the initial cost of gas out of the freights collected to pay his wages, may pay service bills that bring back a profit to the gas company, and may be the owner of a gas bond or some shares of stock

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which enable him to participate in its profits. That doesn't look like ownership by a small group, or like control by Wall Street, does it?

The manufactured gas business of America is one of the biggest co-operative efforts in the world. It has more people's money invested in it, pays more wages, employs more people from first to last, makes greater volumes of its product and does more big things than most people suspect.

It is one of the most stable and best paying businesses in the country, year in and year out. There are gas companies which have paid 8 and 10 per cent. regularly for years, not as the results of overcharge, but from little profits on great volumes of business.

And yet it is only one of the public utilities. There are others as great.

The Average Person's View of the Electric Utilities

How much does the average person know about the extent of investment, results, profits and general problems of the Electric Light and Power utility? Usually comparatively nothing as regards service to the consumer or with respect to its securities as an investment for the spare cash of him who is saving a margin out of his earnings and wants to put it to work to earn him more money.

The familiarity of the average person with the electric light and power company begins and ends with his use of electric current for lighting purposes in home, office, store or factory, and for power purposes to operate the numerous electrical appliances which have done away with drudgery in the household and in the office, and to more efficiently and economically drive the factory machinery. Then too, of course, the average person uses the electric street car, which has two elements, one its motive power, the other its service. Few people think of the motive power in street railway operation. That brings us back to the fact that the average person's familiarity with electricity begins and ends with the pushing of the button, or the turning of the switch, which brings to him instantaneous and continuous light or power.

The Bigness of the Light and Power Industry

The electric light and power industry in the United States today has a total investment of more than five billions of dollars.

It has a gross income of more than nine hundred millions of dollars.

It employs directly a force of one hundred and forty-five thousand men and women.

It employs indirectly nearly two hundred and fifty thousand other workers:—the miners who dig its coal, the railroad operatives who haul it, the employes in factories who make lamps, generators, motors and appliances of all kinds, the salespeople in commercial institutions who vend these to the public and the army of repair men who keep them in fit shape for use.

This industry consumes annually thirty-three million five hundred thousand tons of bituminous coal and three million seven hundred thousand tons of anthracite coal, or a total of thirty-seven million two hundred thousand tons of coal, which furnishes two million two hundred and fifty thousand days of work for the men who mine it.

It serves with light and power the people of more than fourteen thousand cities and villages.

The populations of the places served total more than seventy-one millions of the one hundred and five millions of people in the United States.

In some parts of the country the electric light and power service reaches so large a percentage of the population as to be almost unbelievable. In

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Massachusetts 98 out of every 100 people may have electric light and power. In California 95 out of every 100 people may have it. In Connecticut 88 out of every 100 are in reach of service. In New Jersey 85 out of every 100 may have it. In New York State and Maine 80 out of every 100 may enjoy this facility. Still, the business has not reached its limit. In Mississippi only 17 out of every 100 of the population can avail themselves of electrical service, while in South Dakota only one-third of the population can get electric light and power.

The industry has harnessed falling waters and made their energy available to the extent of six million horse-power, while there is a potentiality of fifty-five million horse-power yet to be improved in the rivers of the country, according to the United States Geological Survey.

The capacity of the producing stations operated by steam, large and small, is fourteen million horse-power.

Every Coal Mine a Potential Niagara

The electric light and power industry furnishes current to light a single lamp or turn a great engine, in some cases two hundred miles from the place where the energy is generated. These are the cases where water-power is used for generation. Yet this is not the end. Already physical interconnection of systems is being brought about in order that a surplus of energy from one may be transmitted to care for a shortage of energy in an adjoining system. Surveys of so-called super-power zones are being made with a view to further interconnection of systems and the establishment of huge generating stations at the mouths of coal mines whence electricity will be sent out over long-distance transmission systems, just as it is sent from a hydro-electric plant located at a waterfall, thus saving the freight on the coal and making the electricity haul itself over the wires. A little more of that sort of development and every coal mining territory will be a potential Niagara.

The production of electricity takes more than thirteen million barrels of oil a year, which is used for fuel. That makes the electrical industry a contributor to the success of the oil-producing business, and an employer of a part of the labor used in oil production and in transportation by pipe line or tank car.

The business of producing electrical energy furnishes the largest existing market for copper. From that standpoint, again, it is an employer of the largest part of the labor used in the mining, refining, drawing and rolling of copper.

Next to the automobile trade, the business of making and distributing electrical energy is the largest user of manufactured and spun brass in the country. It is found in the machines in the electric light and power plants, in the connections, the fuse boxes, the lamps, and—all shiny and covered with nickel in the toaster on your breakfast table, the electric washing machine and electric iron in your laundry, the heater in your bed chamber, the refrigerator in your pantry, the vacuum cleaner, and the hundred and one other appliances for domestic, commercial and manufacturing use.

The electrical industry is the largest user of wooden poles in the country.

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There are more miles of electric lines than there are of either telephone or telegraph lines. That means again a contribution to labor in the forest and on the skidway, on ships and cars, and trucks from the forests where the trees grow to the points where the poles are placed.

The electrical industry is the largest single user of the production of pottery products in the country. When you see a porcelain insulator in your house, or a string of insulators supporting the cross-country high-tension line, you are looking at the tribute which it pays to the pottery business. When you see the trenchmen laying underground conduits in the city streets, through which the wires are led, you are looking at another tribute to the clay industry.

Roughly speaking, there are half a million workers in the United States some or all of whose time is occupied in satisfying the demand for products used and useful in the production of electric power, from the making of it until it responds to your push-button, by giving you light or putting your machine to whirring.

What the People Pay for Electricity

The people pay a lot of money for electricity and for apparatus to use it. In 1920 the estimate was that the electric light and power companies sold \$900,000,000 worth of energy; that the manufacturing companies which make and sell electrical supplies sold \$750,000,000 worth of product. Besides these street car lines earned \$850,000,000, the telephone industry \$475,000,000, the telegraph and cable lines \$200,000,000, and miscellaneous uses of electricity consumed \$150,000,000. Here are \$3,325,000,000 paid annually for service or property which could not exist without the electric light and power companies producing electric energy.

A hundred million dollars in wages were paid by the producers of electricity to their direct employes last year. Twice as much more was paid for the indirect employment which the industry calls for.

There is always a demand for more service, more capital, more of the labor of men and women. Take electricity, generated by steam or water, out of the national industrial life of the country, and a very large hole is made in that life.

The Industry Always Needs Fresh Capital

There is always need for more money for light and power business. Every new house in every city, every new factory throughout the country, every new public or private use of light or power calls for a new investment, big or little, by the company rendering the service. On many farms throughout the country part of the work in the field and around the farm buildings is done by electric power, while the house is electrically lighted and household conveniences are made possible. Millions of other farms remain to be reached, and are being reached, as rapidly as interconnecting systems and extensions of individual systems make that possible, the farmers having learned from their more fortunate neighbors that electricity has made life different from what it used to be. A large part of the hardest work has been lifted from the shoulders

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of agriculture, and the "back to the farm movement" has been accelerated. Extensions of such service to farms not now enjoying it also means that new investment is needed.

That money comes from no clique, no small group, no set of controllers. It comes from the whole people. The investment bankers of the country figure that one million four hundred and fifty thousand people in the United States have some sum of money, great or small, invested in the electric light and power industry. These are in addition to the innumerable banks, insurance companies, churches, societies and other organizations which have invested the funds of their depositors, policyholders, or members in the securities of electric light and power companies. Some of the larger companies have as many as 30,000 stockholders. How many bondholders these companies have no one can accurately figure, because many bonds change hands without being registered. In one little city of Wisconsin, with 30,000 population, one out of every sixty citizens has a little or a lot of money invested in the local electric light and power company.

How many owners of these securities are there in the larger cities? One rubs elbows with them every day. Not Wall Street of New York, nor Milk Street of Boston, nor La Salle Street of Chicago, nor Market Street of San Francisco owns them; it is the American people, your neighbors and friends.

Electric Security Incomes Are Stable

In most of the States which are well settled and prosperous commissions have been established for the purpose of regulating rates and service of these and other public utilities, with the result that incomes from these properties and their securities are both adequate and stable. The regulation of electric service in practice provides for an adequate return such as will pay for running plants, keeping them up, taking care of depreciation and giving a fixed and proper return upon the investment involved. Alongside this, in the interests of the consuming public, the right is accorded to operate without wasteful competition in the territory served. Under these conditions investments in electrical public utilities are made attractive to new investors because they are kept safe.

The light and power business of the United States is one of the most useful, economical and safely remunerative of the industries of the nation.

Yet it is only one of the public utilities. There are others.

The Financing of the Public Utilities

The financing of public utilities is sometimes made the subject of public criticism—by which is not meant criticism *by* the public, but criticism *for* the public, usually by persons who are interested in public utilities only from the standpoint of attracting the public's attention to themselves.

These people, always, and those who listen to them, sometimes, forget to make an analysis of public utility finance. Like the early financing of the railroads, this work was accomplished with much difficulty and much ingenuity, and it was necessary to take into account the important risks to which capital in these ventures was exposed at their beginnings. This was true of ventures in NEW UTILITIES, like electric lighting.

Getting Old-Fashioned Managements to Give Up

In the cases of older utilities which underwent renovation as the results of improvement in their respective arts, consideration had to be given to older organizations which were "sitting pretty," as the saying is, which were making satisfactory incomes under old methods, and which, in most cases, were owned and operated by elderly people to whom the practical rebuilding of their properties did not appeal. This was true particularly of the street railway properties operating horse cars and of gas properties using old-time methods.

Original Public Utility Financing

The original financing of public utilities, therefore, took either of two forms:—

The first was through actual contribution of fresh capital, usually from the neighborhood in which the utility was established.

The second was through the process of interesting financial houses of strength to provide enough capital to buy out the existing old-fashioned utility and, combined with local efforts, underwrite the necessary funds for rehabilitation purposes.

Almost invariably the projectors of these enterprises looked forward to a very considerable growth of the business, and attempted to provide for it in the early capitalizations.

Unexpected Growth of Business

Almost invariably, too, the growth of the new business outstripped the expectations of their founders. Cities expanded, calling for more street car lines. Populations increased, calling for more gas extensions and electric light and power conductors. Uses multiplied, the industrial applications of gas being one of the most conspicuous, calling for greater productive and storage capacity. New processes came into being, calling for greater and more powerful supplies.

Let the reader canvass, if he will, the intensification of effort and de-

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mand that followed the beginnings of modern public utility developments.

In the field of street railway investment, the greater rapidity of transit, compared with horse car service, led to the extension of city boundaries, the opening up of new home sites, and a consequent demand for greater trackage, more cars, more motive power and additional working capital. On the heels of these came the adaptation of electric railway service to suburban and intercity demands.

How the Gas Business Grew

In the field of gas supply, with the reduction of the old rates to the public, came betterment of lighting appliances, calling for more gas for that use; the development of the domestic uses of gas, for cooking and other purposes, doubled the per capita demand made on every gas company; the invention of newer and more accurate methods of treating metals by heat again added to the demand upon the gas supply; and, to some extent, the application of ordinary illuminating gas to the production of power in isolated plants meant a new addition to gas demands. Where old-fashioned gas companies thought they had reached the limit of the extension of their businesses, when they sold annually 1,000 cubic feet of gas per capita of population, the demand has grown until it is to-day from 6,000 to 10,000 cubic feet per capita. These facts called for more money to be put into gas-houses, holders, mains, extensions, meters, devices for increasing and regulating pressure and a dozen other necessities, all costing new money, and making the money harder to get, because of the increasing aggregate competition therefor.

Demands for Capital in the Field of Electricity

In the field of electric development, the first producing companies had their eyes merely on street and electric lighting. Then followed the demand for street railway operation. Next came that for power for small local units, and following it for larger units, until eventually whole factory systems became motor-driven from a single central power company plant. The extension of electric motor drive to elevator operation, to the waterworks pump formerly driven by steam, to the electric fan, to the domestic flatiron, the washing machine, the sewing machine—in fact, to every domestic activity—added another load to the plants. Later on the generous use of light for advertising purposes—its amount became appreciated when the supply for these was cut off during the World War—furnished another great unit of demand. Behind these demands came new problems of getting fresh capital, together with problems of engineering and economics, which of themselves suggested new needs for money.

Communication Called for Fresh Money

In the field of communication the telephone illustrates the growing demand for public utility capital. The telephone was originally financed as a manufacturing enterprise by a group of Boston capitalists; as a

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local operating proposition it was financed by local capital. In that time the telephone was a luxury, and its wires were strung through city streets. But its use grew; everybody wanted a phone; it became demonstrated that long-distance service was feasible; exchanges became centres of intimate and costly apparatus; the wires had to go underground, and vast sums became necessary for the operation and extension of the business. Eventually the capital for these had to come from the whole public rather than from a small group.

And so all along the line.

Parting of the Ways in Capital Supply

Certain public utility enterprises, located in great cities, furnished opportunities for local capital and an appeal to the general public of so satisfactory a kind that they survive as individual institutions. Their business was so great and incomes so sufficient that they could grow as separate organizations, which they did.

Certain other utilities, in smaller communities, found that they soon reached the limit of their capital inducements from local sources. Then followed the introduction into the financial and operating sides of the business of the holding company.

The holding company was and is a part of the evolution of public utility service in the United States.

The Place of the Holding Company in Public Utilities

The preceding chapter was devoted to an exposition of the early financing of the public utilities, particularly of electric street railways, electric light and power companies and gas companies.

This financing was largely done locally, except in the cases of very large cities where some banking house took a hand.

But the demand for the services grew very rapidly, the uses became diversified, the service stretched out through growing cities into suburban and farming communities, necessitating extensions and calling for more cash—and more brains.

More brains? Yes, quite as surely as more money. Brains to make for economies; brains to meet the demands of the new uses; brains to make the services safer; brains to “level up the load lines,” to sell service at all hours rather than at the peak hours; brains to standardize service and methods and appliances, so that the public utility customers and managers the country over would be speaking the same language.

And more money, too, besides the brains.

Thus came the Holding Company.

And what on earth was the Holding Company?

Holding Companies a Combination of Special Usefulnesses

The Holding Company was a combination of financial ability, engineering training, capacity for auditing, and ability along the lines of operation.

It was more than a mere banking-house affiliation, which recommended public utilities to their customers on the say-so of men successful in the business.

The Holding Company was an organization which preached the doctrine of not putting all one's eggs in the same basket, but rather in combining and diversifying the investment in many places.

The Holding Company Realized Economies by Combined Operation

The Holding Company acquired the street railways, electric light and power companies and gas plants of a single city, for example, and realized certain economies by the combination.

The first of these was in overhead expense. Instead of maintaining a public office for each, it combined their operations into a single public office.

It was quite as cheap to handle the finances, the collections, the out-payments, the purchases and the like for all of them as it had been for either of them. That meant a saving.

It was much more economical to have one general manager than the three formerly employed.

It was actually cheaper to let the public make its own choice between

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a gas service or an electric service than to maintain competitive selling organizations for both.

The street railway service called for electric power. It was more economical to produce that power and all the other power required by patrons in one power station for both utilities than in one for each, or two stations. The former meant economies in production.

Economies Realized from Means of Interests in Many Cities

This was the first stage of the Holding Company. The next stage was to acquire control of the electric, gas, street railway and telephone utilities of many cities and operate them under a single management.

From this union of interest flowed greater efficiency to the public, and development of the country districts as well of cities was made possible.

The small gas company in the moderate-sized city, the small electric plant or street railway in the same-sized place could not afford to maintain the best engineering, operating and financial supervision under separate management because of the prohibitive cost.

But when the Holding Company owned electric light and power plants in ten or a dozen cities and rural communities, and gas plants and street railways in ten or a dozen cities, it became possible to have the best quality of engineering, operating and financing ability—which means brains—hired to supervise and supplement the organizations of all of them, a part of a man's time being devoted to each.

So the Holding Company, being primarily a financing company, also became an operating company, having in its head offices an engineer for each kind of service, who could get the most out of each of the small electric, gas or railway plants, guide its operators, instruct its managers and see that the plant itself was always kept in condition to render the most efficient public service. Moreover, this man was competent to foresee the growth of demand, plan for extensions to meet it, and call on the Holding Company to finance it, so that it would be built and ready for the public's use when the demand arrived.

Economies Realized Through Purchases

This combination of ownership worked wonders through its purchasing department. Combined buying of machinery and repair parts, of fuel and other operating materials, of construction supplies and all the other things needful led to more economical buying and the necessity for keeping smaller stocks of repair parts. That meant less capital tied up in such things, and consequently less interest to pay on their cost.

Incomes Average Conditions

The Holding Company introduced another element of safety to the investor. The sun doesn't shine all over the country at once. Storms prevail in some places while sunshine glows in others.

This is as true in the financial world as in the world of weather.

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While business is dull in one place, it is very apt to prosper in many others.

The Holding Company, by owning properties in many localities having different industrial and economic characteristics, averages the business of the country for its investors.

Were their returns dependent upon the prosperity of a single community, they must be impaired when that prosperity is interfered with. In some cases the service of the unfortunate community might have to be cut off. Where investors, through the Holding Company, are relying upon many communities for the safety of their investments, not all are likely to be in bad luck at the same time, and the good fortune of some carries the investment in all, even making it possible to maintain the service in some unlucky place temporarily unable to furnish income for the maintenance of its own utilities.

Thus the Holding Company plan is at once an insurer of income to the investor and of service to the public. In fact, experience has shown it is only by grouping together the combined business of a large number of rural districts and small communities that their people can get anything like the same public utility conveniences and necessities long enjoyed by the large cities. It is not possible to have one large company directly own properties in the small communities in a number of States because of conflicting State laws, hence only through the Holding Company, to own the securities of a large number of companies to serve the small towns and rural districts of many States, is it possible to accomplish the much-desired purpose by giving these long-neglected places the advantages of the large cities.

Holding Company a Developer of Business

The Holding Company is interested in the development of business and the increase of sales of service. This leads to the necessity of maintaining commercial departments, through which appliances are sold to the public after their desirability has been tested. There isn't much in the way of necessary appliances to enjoy street car riding, but there are a deal of them in the enjoyment of gas and electric services. These were well-nigh universally introduced by the commercial sales departments of gas and electric utilities owned by Holding Companies. This commercial development makes service sales, and these increase the volume of business.

Holding Companies Closely Inspect Income and Outgo

The Holding Company has enough business to maintain a high-class auditing organization for its entire group of properties. Through this organization costs are checked, accounts are kept closely collected, comparisons of costs between place and place are made available, proper representations to public regulatory bodies are made possible, and the business is always kept in hand, invariably through facility of employment of the highest class of skilled men.

The Holding Company can borrow money—for such money must always be borrowed for utilities—much more readily than the separate organiza-

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tions could borrow it for themselves. That is where the advantage of great credit appears. Later on, as the earnings have become static, the Holding Company can sell the securities of itself or its constituent companies with a better assurance to the public that their security is sound and their earning power established.

Holding Companies Marketers of Securities

The Holding Companies sell both their own and the local properties' securities in all the forms under which capital is invited from the public, including mortgage bonds, preferred stocks, common stocks, collateral trust bonds, and frequently short-term notes to tide over the periods extending from construction and development to fixture of incomes and permanency of profit.

The Holding Company's existence is based upon insurance against conditions of temporary local losses and opportunity for the highest class of operation.

Each produces an economy in which consumer and investor share alike.

Each produces a condition of safety to the investor and of assurance of permanent service to the customer.

Both are Public Benefits.

The Holding Company of to-day finances and supervises, and through it the public utility service of the city is carried into the rural communities, combining both for community and State betterment.

The Employment Resources of the Public Utilities

Just now, and rightly, the public is very much interested in the question of unemployment.

The President of the nation has called a council of its wisest citizens to devise means for the re-employment of those who are idle.

In such a moment there is a sense of appreciation of the industries which furnish employment to the people—steady, unfailing, uninterrupted employment—provided the people know what they are.

One set of industries which furnishes much greater opportunities for employment than the average person credits it with is the public utilities.

It furnishes that employment by night and by day, year in and year out, with no great change in the quantity of labor employed, except that occasioned by the growth of the business.

Employing Power of Street Railways

Mr. Hoover astonished people in Washington recently when he told that the electric railways directly employ 300,000 American workers, to whom they paid \$300,000,000 in wages every year, or an average of \$1,000 per year to each employee;

That they burn 16,000,000 tons of coal each year, which makes a full year's work for 10,000 miners, and furnishes practically all the employment the year around for 5,000 railroad operatives in moving it from mine to destination;

That they purchase raw materials and supplies amounting to \$500,000,000 a year, of which an average of 60 per cent., or \$300,000,000, represent wages paid from the raw material state to the condition of finished products.

Employing Power of Gas and Electric Industries

Had Mr. Hoover gone a step farther into consideration of the business of gasmaking he would have added another group of 80,000 men employed by the gas utility in the United States, with an aggregate payroll of \$80,000,000; the consumption of 10,000,000 tons of bituminous coal and 2,000,000 tons of anthracite, representing a proportionate wage payment, and the purchase of \$200,000,000 of supplies, with another 60 per cent. thereof represented by payments to labor, from first to last.

Had he covered the field of electric power production, he would have found the electric utility employing directly nearly Two Hundred Thousand men and women, and with more tails to its kite in the way of other hundreds of thousands of workers in the factories of manufacturers and in the employ of contractors and dealers and jobbers, in the operation of electric power on millions of farms, in ordinary factories, in street and home lighting, in chemical operations, in mining made possible by electric

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developments and in the professions which have to do with electrical operations, all dependent for their employment upon the healthy growth of the electric light and power industry, than one could count in a month of Sundays.

Employing Power of Telephone Industry

The telephone industry employs, directly and indirectly, in the United States upward of 200,000 workers, distributed through the classes of women operators, linemen, switchboard maintenance men, clerks, accountants, collectors, fabricators of apparatus, conduit builders and maintainers

and engineers; while if account is taken of the market, that the industry opens up to miners of iron and copper, refiners, smelters, wire drawers, brass makers and moulders, brass finishers, platers, loggers in the woods, transportation employees and a score of other industries, one is lost in the mazes of co-ordinated crafts which find a large part of their sustenance in the demands of the telephone industry.

Nearly 800,000 American workers find employment in the four leading public utilities with which the people of the nation are familiar.

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Utility Workers Constantly Employed

This employment is as constant as the demand for the services which the companies supply. That means that the only factor which enters into its amount is the one of annual growth.

This work is constant. The street cars run in good times and in bad. The telephone is used and useful whether business is at high tide or low ebb. The people must cook their meals with a domestic gas supply whether school keeps or not. Electric light and power are necessities even when business is slack. So that, within extremely narrow limits of variation, the employment resources of the public utilities are constant, fixed and useful.

Few Utility Employees Out of Work

In the great centres of industry there are many thousands of men out of work constantly. Most people meet some of them. Analyze their industrial origin. Try to find out how many of them are former gas workers, former street railway men, former telephone men or former electric light company employees. The smallness of their number will cause surprise.

When Other Work Is Down Utilities Are Active

The moral of this condition is simple: Whatever their temporary lapses, whatever their occasional defects, whatever the development of public encomium or public criticism, the public utilities stand forth as a continuous employer of a quantity of American labor that not only never is diminished, but almost always increasing. When the steel mills are idle, the utilities are serving their patrons. When people are not buying automobiles, and the workers are laid off, the housewife is cooking her meals with gas, and the gas-worker is performing his function. When the railroad workers go on strike, the employees of the street and interurban railroads have to carry the burdens of transportation. Regardless of strikes and business conditions, the electric light and power companies must continue to light the homes, maintain the vigilance of the "silent policemen" lighting our streets at night, and making possible the use of household and factory labor-saving devices at any hour of the day or night. When the storm drives the builder from the growing structures, and the winter's storm makes business travel and social communication impossible, the telephone is invoked to make both business and social intercourse possible.

The utilities always carry normal loads. Sometimes they carry abnormal ones. But always they keep their *Eight Hundred Thousand American Workers* in employment, never less, always building up a demand for more.

The Confidence of Cities in Their Public Utilities

It has become quite the fashion with certain classes of newspapers and certain kinds of politicians to deride the public utilities.

In fair weather these self-elected mouthpieces of public opinion would have the people believe that the public should put no dependence in these very useful servants of theirs. The class of expressions about them ranges all the way from complaints of the cost of the service rendered, through the ascending scale of demands for public ownership, to the climax that they ought to be destroyed.

Of course these people do not really believe what they say nor mean it to be taken literally. As for the public, it bides its time for its own expression and lets the self-chosen mouthpieces wag their chins in their own sweet way.

Public Expression of Confidence in Utilities

Their talk is meant for fair-weather consumption only.

But let foul weather come and the public expresses itself in its own direct way.

Its form of expression is to give the most practical indorsement of the dependence which the public has in the utilities, and that is by depending upon them.

We lately have gone through the preparations for a threatened nationwide railroad strike, now at least temporarily avoided pending adjustment.

Just what happened in making provision for the public needs, especially in the great communities, in anticipation of days of stress?

Here are the answers:

The public had been going along all year in its happy-go-lucky way about providing its winter domestic fuel supply. It did not matter that 16 per cent. of the railroad cars of the country were out of order and that the burden of furnishing the winter's coal must be carried by the other 84 per cent. It did not matter that the railroad executives were beseeching the people of the cities to lay in their coal. The announced date of the strike approached with an actually lighter movement of coal than usual. The heaviest movement of coal during the summer and fall of 1921 was to stock up the reserves of the public utilities to a 60 or 90 day surplus over current needs.

People Looked to Utilities for Their Comfort

What the people, as represented by their community associations, their boards of commerce, and other similar organizations, did was to look to the utility companies and see that they were stocked with coal. Then they said, "Come on, old strike; you can't touch us," because they were content to rely upon the gas companies and the electric light and power

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companies to furnish them fuel in the shape of gas and coke for cooking and heating and energy in the form of electric current for cooking and lighting purposes.

The public simply refused to be worried about its supply of fuel for cooking and heating so long as it had the utility companies to depend upon.

Depended on Utilities for the Food Supply

The boards of commerce and city governments which were confronted with the cessation of a food supply didn't lie down. They made surveys of food stocks in their immediate vicinity and depended on what? On the motor truck and the interurban railway. In the West, where interurban electric railways are highly developed, there was no despair about food supplies. The energies of the food surveyors were expended in locating the food stocks close to the electric railways.

In Ohio, Indiana, Illinois and Michigan, where there are networks of electric lines, the public bodies simply devoted their efforts to arranging for food to transport; the means of transportation, outside those supplied by the railroads, were not even given a vote of appreciation. They were the everyday, commonplace reliances of the people, the facilities which had been tried and found satisfactory in emergencies before.

Railroad Travellers Turned to Telephone

When the steam railroads raised their rates from the old two and a half cents per mile price to the generally existing one of three and six-tenths cents per mile, many institutions found that railroad travel became so much of a burden for their representatives as to create suggestions of new economies in the conduct of business. A generation of time had not fully educated the whole public into practical and economical use of the long-distance telephone. High railroad rates educated a new section of the public that verbal conferences could be held over the telephone quite as well as face to face. Long-distance telephone earnings, therefore, have vastly increased since the last advance in railroad passenger rates. The railroads' carriage of passengers actually has fallen off.

This is the public's vote of confidence in the public utilities which supply heat, transportation and communication.

It is more distinct and clear than all the mutterings of the unconservative newspapers and the politicians.

It is expressed in terms of dollars and cents of business done and paid for.

It is expressed in absolute refusal to go into panic even though the country's normal means of heavy transportation cease to function, so long as the public utilities carry the burdens of providing fuel and heat energy and carrying food to the cities.

Where some of the wiseacres and people who see blue tried to convey the impression that the cessation of railroad transportation spelled revolution, the public simply depended upon their public utilities, the second line of the army of American economic organization, which is so organized as to make revolution impossible.

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Morals from This Vote of Confidence

There are two morals from this splendid vote of public confidence in the utilities.

The first is that in these corporate servants the people have a marvelously organized, splendidly directed, and wonderfully flexible resource for normal service or emergency, and that they know their value so well that they depend upon them in stress as well as in supply.

The second is that such organizations, which stand up to test, and upon which the public so confidently depend, are safe investments of capital, so long as they meet the real demands of the people.

Revolution in the organized economy of the United States can never come to pass while the public utilities continue to function.

The Permanent Usefulness of the Utilities—Gas Industry, for Instance

At various times in the history of the public utilities wise men and keen ones have stopped to take counsel of themselves and have asked whether this, that or the other public utility was really going to be permanently useful. These questions have been asked concerning every utility in the list; the gas industry, the electric light and power developments, the street railway systems. They were not the counsels of pessimism; rather, they were the voices of caution, the expressions of the conservatism which is the real foundation of the utilities as systems of service and fields for investment.

Doubt of the Gas Industry and the Country's Answer

One of these lines of questioning affected the future of the gas industry. When the electric light was developed the world was used to only one purpose to which coal gas could be put, domestic lighting. Some people said that gas could not compete with the new illuminant and that the volume of gas business must diminish. Then came Welsbach, with the incandescent gas mantle, which produced a light which made electricity fight its way. Next came the first generally used gas utensil, the tailor's "goose" or pressing iron.

Then came the line of domestic gas-burning appliances for cooking purposes, which grew from one that appeared modestly on restaurant counters in the form of a chafing dish, with its heat supplied from a crude burner. Some plumber devised that and became the founder of the gas stove industry.

Then came the industrial applications of gas. How many and what they are will make a special piece of reading later on.

Then some new things followed.

By-Products of Gas Reduced Its Costs

The by-products of gas-making came to be considered. The original by-products were coke, gas-tar, and a smelly liquid called "gas liquor." The coke was sold. The gas-tar was mostly run off into the river near the gas works. The smelly liquid took the same course. Gas-tar struggled for a use in industry. It found its way into the roofing trade. Some adventurous spirits mixed it with sand and made city walks from it, the kind which grew soft under the summer sun and held fast the shoes of pedestrians. There are old boys and girls reading these lines who remember that.

Hidden Treasures in Gas-Making By-Products

Then came the chemists. The Germans found a whole line of wealth

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concealed in gas-tar. The aniline dyes, the fever-chasers which everybody prescribes for himself nowadays—phenacetine, acetanilid, and what not—were found hidden in coal tar. In the coal itself with naphthalene, 3,000 pounds of it in 1,400 tons of coal; solvent naphtha, 3,000 pounds more in the same quantity of coal; toluol, 3,500 pounds; benzol, 20,000 pounds; creosote oil, 50,000 pounds, and gas pitch, 50,000 pounds, all out of the same quantity of raw material.

Thus was new money found in coal distilled for gas, and the resultants were two things: The first that coal gas could be furnished the public more cheaply; the second that the demand for the by-products was so great that their market was only limited by the amount of gas that could be made and sold. The consequence was an incentive for the increase of gas sales.

The Smelly Liquid Had Money in It

Meantime the "gas liquor" was not forgotten. It held ammonia, and ammonia holds nitrogen for fertilizers. Moreover, it readily solidifies or liquefies under changes of temperature and pressure. That made it the ideal medium for refrigerating machinery. The world was and is looking for it for both.

The gas companies only furnish the raw materials for these uses from the by-products of their gas-making. They sell their coal tar and ammonia liquor. Other industries finish them into commercial forms.

By-product income of gas companies has reduced the price of gas to the public and has forced the companies to find new uses and users for gas to increase their sales. This has made it come to pass that the gas industry, so far from failing in competition with electricity as an illuminant, has found a field of its own. The figures tell the story.

From 1910 to 1920 the amount of gas used annually in the United States has more than doubled.

The number of services has grown to Eight and a Half Millions.

Seven million gas cooking appliances are in daily use in American homes.

Two and a half million gas heating appliances are connected for service.

In the industries two thousand and different operations depend upon the city gas supply for their continuance.

That doesn't look like an industry that lacks permanency for itself.

But that is not all. The development of the gas industry has had a remarkable effect upon American industry.

Industries That Gas Making Developed

Thirty years ago there wasn't a commercial gas-consuming stove offered for sale in the United States. To-day there are gas stove-producing plants, each employing a goodly force of men, in twenty-three of the American States. There are more in Canada. There are ten such plants in Chicago,

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eight of them in St. Louis, seven in Detroit, seven in Cleveland, twelve in New York City, and others in Newark, Albany, Brooklyn, Geneva, Jamestown, Long Island City, Peekskill, Rochester and Troy in the State of New York.

The business of making gas stoves and ranges is furnishing employment, entire or partial, to more than 30,000 workers in this country.

That is only the beginning. Thomas's Register of American Manufacturers shows 364 different classes of American industry which produce things the demand for which and whose usefulness depends upon the presence of a city gas supply. They range through a schedule of diversification that begins with cast-iron street mains and ends with the blow-pipe which one sees the jeweler using at his bench in the shop window.

Dependence of Industry Upon Town Gas

The dependence of a large share of American industry—both establishments and men engaged in them as workers—upon the business of supplying town gas to the American public is so great that if there were no other supply of funds available they alone would be justified in providing the capital required for its extension.

The dependence of American labor on the gas industry is so great that if it were conceivable that the use of town gas might pass away overnight, nearly 300,000 American mechanics would have to adjust themselves to idleness or new occupations in the morning.

The dependence of the gas companies upon the conditions in so great a variety of American mechanical trades, and so great a number of American markets for the eventual disposition of their by-products is so great that the cost of making and supplying gas to the people is being more or less seriously influenced by them every hour of the day.

Wonderful Stability of Cost and Returns

Let the consumer and the investor conceive, if they can, that the prices of coal, the raw material, are changing daily; that there is a new price every hour on either coal-tar, or ammonia, or anilines, or acetanilid, or phenacetine, or iron mains, or valves, or gas cocks, or iron borings, or recording gauges, or nitrogeous fertilizers, or benzol, or naphtha, or hemp packing for mains, or lead for joints, or creosote for sheep dip, or nitric acid for explosives and fertilizers, or a thousand and one related markets, the variations of each affecting the gas industry much or little. They will be amazed that the price of the product to the people and the returns are so completely stabilized. They will also understand why every politician cannot encompass the gas industry with his undeveloped mind and experience.

Gas prices haven't changed in American cities five times in twenty years, and of these changes an average of three was downward.

A gas company in Cincinnati has paid its dividend regularly for fifty-five years.

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Few other American industrial operations can show such a record of constancy, stability and fundamental soundness. Those that compare with it are the other public utilities.

The gas industry is one of the most conspicuous examples of permanency and stability, development of new fields and occupancy of new markets, constancy of return to capital and labor, and diversity of allied industries to be found in the history of American industrial adventure.

The Stability of the Utilities—Street Railways, for Instance

The stability of the public utilities, the newer ones, at any rate, has never been questioned. Sometimes that of the older ones is questioned. People like to look into the future. Not all see alike. The men of least vision once in a while make surprising statements. A few, either from lack of information or to appear impressive, make alarmist assertions.

The street railways and their future have given some of these latter food for thought, and the question of their permanency has been raised.

Are the surface railways in American cities going to continue as the reliance of most of the people for their movements within the cities?

Street Railway Business One of the Greatest

Listen, Reader!

The street railway business in the United States is one of the biggest businesses in the country. The people spend Nine Hundred Million Dollars a year for street railway service. That is a pretty well-grounded business. The expenditure for street railway service is growing greater year by year. No year in the past twenty has shown a falling off from its predecessor. The railways have had some ups and downs during the war period, due to abnormal prices of fuel and labor, but so did other lines of business. All of them are settling down to normal, but the people are still spending as much money as ever on street railways.

A business which does Nine Hundred Million Dollars of business isn't a weakling by any means, nor is it showing signs of decay.

The business of growing, refining and distributing sugar is a staple business. The American consumption of sugar is approximately ninety pounds per capita, or approximately ten billion pounds a year. The American people pay less than \$700,000,000 a year for sugar. The total volume of business in this staple product and necessity is less than the volume of the American street railway business.

When the demand for sugar begins to fall off it may be time to consider the possibilities of the decadence of the street railway business.

The Greatest Problem Before American Cities

The greatest problem before American cities to-day is that of increasing the capacity of their streets. The use of the motor vehicle has made this problem.

Time was when Mr. Bonner drove a \$5,000 turnout down Fifth Avenue, in New York, or Mr. Billings did the same on Michigan avenue, in Chicago, or General Alger made a similar display in Lafayette Avenue, in Detroit, that people stopped to look at them as they passed by. To-day, in a single block of downtown street in any American city, one may inventory

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\$150,000 to \$250,000 worth of motor cars during business hours and nobody turns a hair.

The Makeshifts for Increasing Street Capacity

The city administrations have not formulated the solution of the problem of increasing the capacity of the streets, but the problem is forcing itself upon them day by day. The American traveler will recognize the makeshifts and the temporizing processes when they are called to his attention.

The city administrations are limiting the time for which motor cars may be parked to from thirty to sixty minutes. The same cities have old ordinances permitting horses to be hitched six hours before the police impound them.

"Ask Dad—He Knows"

This is the type of horse car generally in use thirty-five years ago, before electric railways were perfected.

The city administrations are cutting away sidewalks and giving the added area to the streetway to increase its capacity.

The city administrations are limiting parking of motor cars to but one side of certain streets.

The city administrations are making certain streets "one-way" streets all over the country.

The city administrations are using approximately one-fourth of their police expenditures on "traffic regulation." Thirty police officers out of

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every hundred employed in the United States to-day are "traffic cops."

The city administrations are vying with each other in the adoption of new methods of despatching wheeled transportation through the streets. Fifth Avenue's "crows' nests" and colored signal system have been copied in every important city in the country.

All of this has had to be done to give greater carrying capacity to the streets, which are fixed passages, lined with costly structures which mark their limit of use.

Motor Car vs. Street Car as a Carrier

The average motor car occupies sixteen feet of the public highway. It carries from two to seven people.

The average surface street car occupies fifty feet of the public highway. It can carry one hundred people.

The relief of the public highway and the increase of its capacity will be solved as civic problems by the surface street car. Few cities have subways and elevated railroads.

Surface Street Car Will Solve Street Problem

Safe and speedy traffic through city streets is already becoming noticeably dependent upon the surface street car service. In the contest between the motor car user and the non-user of motor cars for the use of the street, the latter must depend more and more on the surface street car.

There will always be more non-owners than owners of motor cars, useful and pleasant as the latter may make their ownership.

This means that the surface street car line, as a public convenience and an investment for capital, returning a respectable income, is coming into its own in American cities as it never did before.

The problem of increasing the capacity of city streets can only be effectively solved by the surface street car line.

The Permanency of the Public Utilities—the Telephone, for Instance

The permanency of some of the public utilities has been questioned from time to time, only to have the questioned utility give back an answer indicative of its virility.

This was the case with utilities already well established, about whose continuance and growth some people who have "blue Mondays" have professed to feel worried from time to time.

Another class of doubters find voice occasionally with a fear that the limit has been reached in the extension of this, that or the other of the utilities. These "birds" use scientific and economic terms. They fear that the "limit of saturation" has been reached, which doesn't mean anything about water at all, as might be supposed, but that the absorptive power of the public for the service of this particular utility has been reached.

Of no utility has so much of this class of questioning as to its future been indulged in as the telephone. Nobody quite understood the usefulness and applicability of the telephone in the earlier years of its use, nobody knows now how wide a field still remains for it to grow into.

A Great Financier Who Hadn't Telephone Vision

Not so very long ago, as the years of men go, the telephone was being introduced into an American city now grown into the million class. A youngster who may or may not have been the writer of these lines was then a telephone operator—the bright young women had not then entered this field of activity. The telephone service of this particular city had then been developed to a business of 800 subscribers and lines. The financial genius of the company was a man who was then on his way to what he became later—a leading American manufacturer of great vision, a senator of the United States upon whose words his associates hung for guidance on great national commercial and financial questions.

Time came when the enterprising manager of this telephone company induced his capitalists to double the capacity of his telephone exchange.

Telephone Hopelessness of a Capitalist

When it was all completed, with provision for 1,600 telephone subscribers in a city with a million inhabitants to-day, the future senator of the United States and his brother, also a competent capitalist, inspected the new property. In the hearing of the youthful operator above referred to the Senator-to-be said: "William (meaning the general manager) is plumb crazy. There will never be enough telephone users in this city to fill up these switchboards."

That was when people talked into the little black walnut boxed Blake

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transmitter attached to the wall. The desk telephone set had not yet arrived.

That was before there was a long-distance telephone line, short or long.

That was before there was a telephone in a hotel outside the clerk's desk. People were pulling bell wires and pushing electric buttons to get their ice-water and have their boots blacked.

That was before a telephone booth was built for a private telephone conversation in a public place. People who used telephones had to bawl out their business so that they could be heard all over a forty-acre lot.

That was when the induction between adjacent wires in the air and on the switchboards gave folks a chance to hear most of their neighbors' conversations.

That was before there was a farm-line telephone.

The Developments of Telephone Use

That was before the multiple switchboard had to be designed and perfected to carry the load of telephone demand for connections.

That was when the telephone was an aristocratic luxury, for which he paid a handsome sum per year, quarterly or half-yearly, in advance.

That was before manufacturing institutions, hotels, hospitals, educational institutions, city governments and a dozen other activities had to have internal telephone systems, each as big as the system which the really far-visioned Senator-to-be of that day and generation felt was too big for his city.

That was before a single industry, housed in a single building, in the distinguished capitalist's own city, had an internal system for its own use alone twice as great as his concept of the ultimate demand of the whole city, with 100 trunk lines and leased telephone circuits both to Chicago and New York.

That was before telephone service had become so reasonable and so necessary that the smallest business man could afford to purchase and use it profitably, and the household that has no telephone service is only every second one in American cities.

That was before the time when a passenger ship's hawsers tied her to the dock simultaneously with the making of connection with the city telephone service, so that her patrons could call their homes, their families, their offices and their business associates.

Modern Applications Increased Development

That was before the "smart" railroad trains only lose connection with the telephone exchanges of their terminal cities when the conductor sings "All aboard" and the engineer pulls his lever.

That was before telephone conversations were carried on without wires, through the air, across continents and under rivers and lakes.

That was before America had shown how to link up aerial lines with wireless gaps, and telephone engineers had taught the telephone folks how

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to shut out the annoying neighborly conversations, and to "load" lines so that a thousand-mile service was as efficient as a single-mile service.

That was before a single mile of telephone wire had been laid underground in conduits in a single American city. To-day an aerial line is a rarity.

That was before the telephone folks thought that the service would "stand for" the use of copper wire, when the telephone business of the country was carried on through iron wire, black wire at that, not even galvanized.

That was when telephone operation was "burdened" with the wages of boys earning from \$13 to \$20 a month. The standard wages of skilled women operators are from five to seven times as much to-day, while rates are about one-half what they were then, and less than one-tenth, if quality and facility of service be the standard of comparison.

That was before anybody thought of having an extension telephone in his home, a "bedside" telephone or a "wayside" service to enable the stalled motorist to call relief.

That was before a railroad terminal station did as much telephone business in terms of to-day as the whole city did in terms of then.

What It All Grew to in a Single Lifetime

The city which the future senator of the United States confidently declared would never absorb telephone facilities fit to handle 1,600 lines to-day has 200,000 telephones.

The 1,600-line exchange about whose future he was so pessimistic has grown into a system of 15 exchanges in the same city, all inter-connected, and each with a capacity of from six to ten times the capacity of the exchange which he thought would never be filled.

In that city the \$300,000 capitalization of that same telephone utility has grown to a \$40,000,000 capitalization, all usefully engaged.

The \$80,000 annual income has grown to nearly \$10,000,000.

The seven thousand daily messages conveyed over the lines have grown to seven hundred thousand.

The \$120 a year annual rental has fallen to seventy-two dollars for a better service.

The semi-annual and quarterly statements of rentals have been succeeded by monthly bills, which enable people to pay for their telephone service as they do for their grocery bills.

Nothing Local About Telephone Experience

Nor was this telephone experience unique. It was duplicated in New York, Boston, Philadelphia, Chicago, Detroit, Cleveland, Cincinnati, Buffalo, Pittsburgh, Baltimore, St. Louis, and another score of cities of size; and, proportionally, in practically every American village and hamlet that has a railroad station, post-office and a school.

The growth of a united, coherent, inter-connecting, centrally controlled telephone system, having an opportunity to test out and apply every im-

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provement in the art, was neither hindered nor menaced by competition. The competitors logically either died, merged with it or arranged to secure connections to give real universal service.

The man who says to-day, in face of this growth, that the telephone has reached its limit of use is talking as idly as did the "wise" capitalist of nearly forty years ago.

The Permanency of the Utilities Calls Constantly for New Capital

In the immediately preceding chapters attention has been called to the permanency of the public utilities.

No American community is static in its growth. It must either go ahead or go backward. Most of them go ahead. Only those go backward whose existence is dependent upon the harvesting of some natural resource, whose supply is limited, such as timber, or the products of a mine or quarry, or oil or gas deposit.

The ordinary American community is instinct with life. It grows, sometimes unexpectedly, sometimes modestly, but it grows.

Utilities which serve these communities must grow, too. The city cannot extend over new areas without sending out its call for new street railway lines, new gas extensions, new electric services, new telephone leads and distribution systems.

That is the difference between the public utilities, strictly so described, and the wider spread agencies of transportation and communication—the railroads and the telegraphs. The latter do not bring their services directly to the people. The railroad brings its freight to the terminals, where the people go to get it; and the industries locate themselves along the railroad tracks, for receipt and despatch of carloads of freight. The telegraphs content themselves with a central office, usually. In the larger cities they have branches, which are, after all, only other central offices. Some personal service, either of the messenger or the telephone operator, must supplement their effort before they come in contact with the people.

Utilities Reach the People with Directness

But the public utilities reach the people personally.

To travel through cities the people must get on the street cars, individually, pay an individual fare and take individual rides, getting on and off at specific places determined by individual convenience.

The householder must have his electric energy delivered to him personally, at his lighting fixture on wall or ceiling, to the reading lamp on his library table, to his washing-machine and flatiron in the laundry, to the fan in his office or sleeping-room, to the toaster and the percolator on his table, to the other apparatus for the thousand uses to which he puts the electric servant of mankind.

Public Utilities Must Extend to New Customers

The citizen must have his gas supply delivered to the cooking range or hot plate on which he makes his food ready for use; to the water-heater upon which he calls for instant service, to the gas-log which takes the chill from his own room, to the burner under the dye-pot, the fur-

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nace for heat treatments in his factory, the thousand uses to which town gas has been put in modern living and present-day industry.

The user of the telephone must have his telephone service at his elbow, not at a central depot to which he may repair for communication as with his railroad contact, nor to an office where his message is written out and passed along by hand, as with his telegraph contact.

Nobody ever heard of a user of railroad service doing anything else than locating his factory or his warehouse close to the railroad facilities. He has to go to them.

Nobody ever heard of a factory being located with reference to existing telephone, gas, electric or street railway connections. They are expected to COME to their new customers.

Extensions Must Be Planned for Long Futures

The new factory in the suburbs, the new subdivision for modern homes, the new warehouse "out on the tracks," in every American city, calls for extension of the public utilities, and sufficient expansion to take care of the future, as well as the immediate present needs. The street railway must lay just as good a track as if it were for a heavy service. The gas company must lay a large capacity service main, because other factories and other housing centres will follow the pioneers. The electric supply that furnishes energy to the first user must have capacity for more. The telephone company cannot string a single circuit economically. It must put out a 25-pair, 50-pair or 100-pair cable, as the prophetic vision of its engineers figures the demands of a year or two ahead.

Extensions Call for New Capital

Because it is not his intimate business, the average user of these services does not ordinarily credit how much "forward construction" must be provided by the utility companies to keep up with the growth of the average American city.

The telephone companies used to estimate that, to make proper provision for demand, an average of 40 per cent. of their facilities must remain unremunerative. As the public demands have become further satisfied this percentage was reduced, but a very substantial amount of such property must still be kept idle for immediate connection when customers call for it.

To a proportionate extent this is true of all the public utilities.

These conditions call for constant additions of new capital to that already invested by public utilities.

The public utilities, to serve the public, must constantly get and lay out large amounts of new capital.

How New Capital Is Found for Public Utility Extensions

There is a constant demand for new capital for American public utilities. This capital must be found if the utilities are to continue to grow. They must grow or they cannot satisfactorily serve.

This capital is not found by public utility managers on their simple statement that they need it.

They must first of all show that their industries will support it, which means that the business is profitable enough to pay an adequate return, with regularity, upon the new investments which they ask the public to make. They must also show that the public, through the duly constituted authorities, will permit the utility to earn the adequate return.

Therefore there is a parable in the getting of new money for investment in the public utilities, not only for the public utility managers, but for the public utility users and for the whole public represented by its governing officials.

The Whole Public Interested in Success of Utilities

The whole public is interested more importantly in the success of the public utilities and their ability to finance than is any single section of it, whether that section be the utility managers, or the users of the various utilities.

The whole public is interested in the value of its real estate and the returns therefrom; in its accessibility and usefulness; in the growth of industry and facility of access to industrial centres; in the housing of the people and their decent living; in the economies and humanities of life. These constitute the civilization of cities and without the public utilities the civilization of cities cannot survive.

The whole public is interested in the provision of new capital to extend the public utilities just as much as it is in the original investment in these enterprises.

A new street railway, a new electric supply, a new gas works or a new telephone service always arouses public enthusiasm. The doubling or trebling of the service of any of them is equally deserving of public appreciation. The development of a community and the extension of public utility service go hand in hand. Unless new capital can be secured for such extensions the community suffers.

The new capital for public utilities cannot be obtained unless public appreciation is great enough to permit the utilities to earn enough money to pay for the use of the new capital, at the current commercial return upon investments in other lines of business, subject to equivalent risks.

The Attraction of Capital to Utilities

The capital of the public can be attracted to public utilities only by an adequate return upon it.

NEW CAPITAL FOUND FOR PUBLIC UTILITY EXTENSIONS

Men and women who have money to invest and are unwilling to take any risk at all can buy government bonds and earn nearly five per cent. upon their funds.

In any times since 1900 a man or woman who had money to invest could purchase well secured notes with it and earn at least six per cent. In neither case did they have to consider the public's favor or disfavor of the investment.

At any time now a man or woman who has spare money can invest it in real estate mortgages and earn six or seven per cent. or more, still having no concern with any person other than the one who makes the mortgage. The public utilities must meet this competition when looking for new capital, and to that end are nowadays required to pay an average of eight per cent. or more for money invested in their industries.

To obtain capital on this basis the utilities must show that they are able to pay a constant return upon it, in addition to the stipulated return upon the capital already invested.

As a matter of fact the public utilities have been doing financing all the time. Some of the money enlisted in them was obtained for them when money was "cheap," that is to say, when interest rates were lower than to-day's interest rates.

For example, some companies have outstanding five per cent. or six per cent. bonds that were issued some years ago and do not mature for years to come, as compared with the seven per cent. or eight per cent. bonds that must be issued to-day because of changed conditions.

Only a part of the new capital can be secured through interest bearing obligations. The balance must be obtained through issue of preferred and common stocks at a higher cost to the utility.

Public utility financing is done at the market rate of the period when new capital is required.

The average rates of return on the whole investment, represented both by bonds and stocks, determine the rates for service which the public must pay.

The public must pay such returns for the service rendered it by the public utilities as will carry out the engagements made between the utilities and the people who invested in them, these engagements having been made at the market rate for the use of money when they were entered into.

The Public Enjoying Low Interest Rates of Years Ago

As a matter of fact the public is enjoying to-day the use of capital invested in public utilities at rates of interest which prevailed ten, fifteen, twenty years ago.

For such new capital as is attracted to them now the public must pay the rates which prevail to-day.

For what is needed in the future it will have to provide earnings at the going rate then, be it high or low.

NEW CAPITAL FOUND FOR PUBLIC UTILITY EXTENSIONS

Present-Day Financing Based on Several Conditions

The financing of public utilities to-day is therefore based on several conditions:

The first of these is an appreciation of the benefits of the utilities in providing transportation, power, fuel, light, communication.

The second is the honest delivery of the goods by the utility managers, who are bent on serving the public in the best possible manner.

The third is the appreciation of the public of the service rendered and its willingness to pay a fair price for these services, which will pay operating expenses, keep up the works and properties, pay a fair return on the capital invested, and leave a little more for give-and-take, to cover the needs of rainy days in business and lean years of income.

The fourth is the appreciation of this public good-will by the investor who is asked to put in his money. He will invest only where the producer, which is the utility, and the consumer, which is the public, are in hearty accord.

Public Relations of the Utilities as a Rule Pleasant

Despite the occasional outbreaks against public utilities, occasioned either by politics or demagoguery, and occasionally by inadequate service, the relations of the American people to their public utilities are generally pleasant.

Municipal councils and public regulating bodies as a rule exhibit much appreciation of the usefulness of these agencies of civilization.

In the cities where there is conflict or refusal on the part of the public to allow an adequate return, there is usually inadequate service as a result, because the money people have to invest in utilities will go to other communities.

To one city in which there is conflict, however, there are a hundred where there is none. To one year of disagreement there are ten of agreement.

The conflicts are "played up" much more than the periods of peace.

In their relations with their public utilities the people of American cities, as a rule, exemplify a deep knowledge of the fact that public utilities can only be financed by the willingness of their users and the public to let them earn a legitimate return.

The Financing of the Public Utilities

Unless the public concedes its corporate public servants the right to earn the cost of performing service, which cost must of necessity include a decent return upon the capital involved in their operation, there can be no attraction for new capital, for which there is always a demand.

Basically, the public finances the public utilities by furnishing them an income sufficient to attract the money of investors.

Investments Are Safeguarded

Capital invested in public utilities has certain safeguards. First of all, the public has decided that the utility business is and should be monopolistic in character. It reached this conclusion in its own interests.

The public found, for example, that one telephone company can give each of its subscribers connections with every other user of the telephone. It found that one set of gas mains or one electric light plant and set of wires could give the same service at half the investment required under competitive conditions and that the users of such service should not be required to pay a charge therefor sufficient to give a return on duplicate investments, any more than they should be required to pay four cents postage in order to have two sets of postmen come to their door with letters. It learned that even though competitive street railway systems are not on the same streets of the city, there are difficulties about continuous rides and that overhead expenses and operating costs are increased.

Should Earn a Fair Return

Having adopted this monopolistic principle, the public set down certain rules that should interest investors. It ruled that the public utilities should be under the constant supervision and regulation of the public; that the books of record should be standard and uniform and tell the true story; that investment in items of property not necessary to efficiently serve the public should not be made, because such investments only tend to interfere with the earning of a fair return under reasonable rates; that competition cannot come about without consent of the State agencies after full consideration; that salaries out of proportion to services rendered should not be paid.

The public also ruled that the utilities should not be allowed to earn more than a fair return on the property used in the public service.

Having so determined, it was only fair that the public should hold that the public utilities *should* be entitled to charge rates that would realize that fair return—not merely the nonconfiscatory return that barely escapes condemnation by the courts, but a return sufficient to reward ingenuity, efficiency, and economy, and make the business a safe one for investors to put their money into.

The public in some States has applied this principle to the extent of allowing a fund to be accumulated over and above the fixed fair return in

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order to insure the regularity of payments to investors even during temporary periods of depression, and in some cases the utilities have been relieved from burdensome taxes and other conditions that might otherwise interfere with the earning of the return.

All these acts of the public, while making impossible the profits that are allowed and received in other lines of industry, tend to safeguard the investment and thereby lower the return by way of interest or dividends that the investor will demand for his money.

High Interest Paid on Securities

But the public, while guarding against excessive profits, has not guaranteed that a return will be earned. The risks, while lessened, are still present. That is why even a first mortgage, well secured bond of a public utility must call for a considerably higher rate of interest than a government bond. The financing of a public utility is no simple matter even when the fair return is being earned. The utilities require capital so constantly and in such large amounts that no one class of investors can provide it.

There are certain institutions and people who must, by law, or of necessity, look to the security of their money and the absolute regularity of interest thereon, even at the expense of greater income. Trustees, banks, and insurance companies and some people of small means who are absolutely dependent on the same belong to this class. There is another class composed of business men and people of limited means, but probably with some funds to invest who, while looking to a well-protected and reasonably sure investment, desire something more in the way of return than the first class. Then there is another and much smaller class that can afford to take some of the risks in return for a probability of a higher return.

The securities issued by a public utility are designed to meet and attract all these classes.

The multiple classes of securities put out by any one utility are issued because of the necessities of the case. "There is a reason," as old Dr. Munyon used to say.

For the first class of investors there is the well secured bond and interest-bearing security. The second class is appealed to through a 7 per cent. or 8 per cent. preferred stock. For the third class is designed the common stocks.

Holding Company Averages the Risks

Sometimes the common stocks and other junior securities of several operating utilities are vested in a holding company. In this way the risks are averaged and the cost of money is lessened because a still further class of people can be appealed to, namely, the people in the twilight zone between the second and third classes above referred to.

The average of the return demanded by these various classes of investors determines the rate of return that the utility must earn if it is to continue to serve the public effectively. And, in any particular case, the types of securities are chosen that will obtain the total capital required at the lowest average cost.

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Institutions specially organized and qualified for the purpose—that not only are versed in the needs of the particular utility and the public it serves, but as well in the demands of investors and the sources of available funds—oftentimes determine the character of the securities to be issued. After that the plan adopted must run the gauntlet of company officials, public representatives, and investment bankers. Under these circumstances the investors in public utility securities are unusually safeguarded. They must, however, assume the risk that the public's representatives, either because of political demagoguery or through lack of appreciation of the needs of the situation or otherwise, will prevent the utility from earning the necessary return. Unfortunately there have been past experiences which have shown that this risk is a very real one in some instances. But the public is becoming alive to the fact that its own attitude toward its public servants has a great deal to do with the cost of that service. Users are beginning to work with their utilities rather than against them. The risk is, consequently, being gradually lessened, and with it the cost of new capital. It is a case of casting bread upon waters.

The Financing of Public Utilities

Place of the Investment Banker

The law has thrown safeguards about the investment of capital in public utilities, so that the money of the investing citizen may be safe, and the patron of the industry be protected from the results of unnecessary or excessive capital investment.

Really, the two protections go together. If the patron has to pay more for his service than it is really worth, the capital investment is in danger.

Protection Given the Investor in Public Utilities

The protection of the investor in public utilities does not end with the performance of their functions by the public regulating bodies.

But the action of the public bodies hasn't brought the real money into the enterprise yet.

At this point the service of the investment banker is called in.

The investment banker does not perform the same function as the commercial banker.

The commercial banker receives the money of the public on deposit, subject to withdrawal, with or without notice as the case may be; operates the machinery for collecting the many kinds of credits which the public deposits, such as checks, drafts, acceptances, and the like; and from the body of deposits temporarily uncalled for, loans for business uses, at a given interest and for short periods, such sums of money as his customers desire and as he approves. Theoretically, at least, every dollar on deposit with the commercial banker might be withdrawn at any time. Practically, only a limited amount is called for on any day, which amount of withdrawals by customers is offset by their deposits. But the commercial banker, from the nature of the possible demands upon funds held by him, cannot invest them for very long periods or under such conditions that they may become permanent capital for his customers.

The capital required by public utility companies is permanent capital. Its common stock investment is for as long a period as the life of the corporation issuing it. This is also usually true of the preferred stock. Its bond issues run for twenty, thirty or fifty years, and sometimes longer.

The commercial banker cannot invest in stocks at all, nor can he tie up the money which is deposited to-day and may be withdrawn to-morrow for ten, twenty, thirty or fifty years.

That kind of capital must be supplied by people who want to and do invest their money for long periods.

Place of the Investment Banker in Utilities

There are many persons and institutions which make such investments

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and many transactions which require them. For instance, the endowment of a great institution of learning is put out to earn an income to support the institution. The longer the time for which it can be put out safely, the surer the institution may be of performing its function for many years ahead. The life insurance companies must invest the annual premiums of their customers so that while the insurance policies are in force these premiums will be piling up income to pay the policies when they mature. Trust funds, legacies, and annuities call for the same class of long-time investment. Many private capitalists who invest their money directly like to be relieved of the burden of seeking new opportunities for placing their money. They, too, favor long-time investments.

The aggregate of money seeking long investment is very great. Its demand for such investments is continuous the year around and year after year. The "peaks" of such demand occur when the semi-annual or quarterly returns are made on money already invested, when the interest and dividend returns are available to buy more.

Formerly, real estate mortgages afforded the principal opportunity for long-term investments.

More recently, the industries and the utilities came into the markets for money. The average investor could understand mortgages, but street car lines, gas works, telephone systems and electric light and power systems were beyond his ken.

Enter the investment banker.

The investment banker is equipped with special knowledge of such properties, keeps an eye on who is fit and who is not fit to operate them and supervise their development and financing, knows when they are doing ill or doing well, has technical advisers to pass on their construction and operation, watches their development and has a close enough relation to influence their conduct.

Before any funds can be obtained by the utility companies for their new enterprises, these must usually have the approval of the investment banker.

Watching Interests of Investors in Utilities

Before the investment banker gives his approval these things must happen:

He must be satisfied that the properties are in good physical condition, and he usually has his own engineers determine that.

He must be satisfied as to whether the properties have been remunerative in the past, and he usually has his own selection of public accountants to determine that.

He must be satisfied of the moral risk involved in putting money at the disposal of the management, and he usually determines that himself.

He must be satisfied that the new money is needed and will earn an income on itself, and he usually decides that for himself on the advice of his engineers and accountants.

He must be satisfied that the investment will be good enough to keep for himself, even if he doesn't sell a dollar's worth of it to the public.

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Usually his "underwriting" contract requires him to take and pay for the whole issue, whether he sells it to the public or not.

By the time a public utility issue has been offered to the public by a responsible investment banker it has been scrutinized so closely that it is as safe an investment as human foresight can provide.

Customer Ownership of Public Utilities

The last two chapters have been devoted to a review of the safeguards which surround the issue of new public utility securities.

They have back of them an industry that the public has declared must be monopolistic in the interests of the public; and because of that characteristic they are regulated as to rates so that they may receive a fair return upon the investment necessary to enable them to render continuous efficient service.

They must undergo the scrutiny of investment bankers, who determine whether they are safe enough to own in case the public does not purchase them.

No other class of securities offered the public is in exactly this same class as an investment.

Who Should Be Investors

Three classes of public utility issues usually are offered to the customers and the public: first mortgage bonds, preferred stock and common stock.

First mortgage bonds usually do not exceed, in their total amount, one-half of the values of the properties securing them.

Preferred stock issues rarely reach in their amount the third quarter of the total value of the properties upon which they are based.

The common stock of these corporations usually represents from 25 to 33 per cent. of their total capitalization and value, thus furnishing a sufficient shock absorber against the fluctuations of the business to make certain that bond interest and preferred dividends will be paid.

The people who most logically should invest in these securities are the persons who use their service, who provide the demand which produces their earnings and who can make a commercial return upon their investments in the corporations which supply them with electric, gas, street railway, and telephone service.

Whether the reader lives in New York or in a city one-hundredth part as large, he can recall some history like the following written among his friends in the big city or his neighbors in the little one. The incidents were, in skeleton, like these:

Capital That Might Have Been Saved

Twelve years ago "Billy" Jones, who was a good young man of the locality, came back from Northwestern Ontario with all the maps and papers for a gold mine which he had discovered and opened, and with samples of the ores, but in need of money to put in a mill. The local business man, who didn't know gold mines or gold mining, took some stock

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in "Billy" Jones's Blue Sky Gold Mining and Development Company, and so did everybody else, "Just for a Flyer." Maybe \$50,000 went into the mill; it wasn't just the right kind of a mill; more money had to follow it; the takers of "flyers" lived on the hope deferred which maketh the heart sick, and the gold mining company just "petered" out. Nobody ever saw a dollar of his principal or of interest thereupon.

Then came along the nice man who was going to build a factory at home. There was much money being made in the rubber tire business. The nice man knew all about the rubber tire business. He could tell Para rubber from Ceylon, and the two of them from synthetic. And he had the blueprints and an option on a site right at home. The river water was just right for rubber working and the centre of distribution for the United States was right there where you see the point of his pencil, here at home. Well, he got a hundred thousand dollars in hundred and five hundred dollar lots, installed some machinery, got an unlucky superintendent, then had to go against a cut in prices, and the windows of the factory are now blackened and dark. Nobody ever saw a dollar of that capital come back or a penny of interest thereupon.

Meantime everybody worked and saved to lay up a few new dollars for a rainy day.

And just then it began to look as if the oil supply of the country wouldn't last more than thirty-three years and seven months, and all the people who didn't use oil or gasoline began to worry about it.

And coincidentally, and almost providentially, nature came to the world's rescue with a newly-discovered oil field, with gushers and spouters and bonanzas, which became as familiar to the reading public as the achievements of the most popular ball players.

The Money the Oil Wells Swallowed

And just then there came to town, invited by someone "in the know," a man who had leases on land just four miles from the latest successful strike. The geography of these was all over the country. Some were in Ohio, some in Pennsylvania, some in Kentucky, lots of them in Texas, and now they are coming from Louisiana. Oil is attractive. It is "make or break" in oil. What's a hundred or five hundred "just for a flyer" to help drill an oil well? An old oil prospector in the town or a moon-faced geologist were great aids for setting the stage for this piece. And here went a hundred thousand dollars—again in five hundreds and single thousands—of which hide or hair was never seen again, nor a penny of interest on the money which was sunk.

This is not frivolity. It is the history of individual investment, unguided investment in things which the people do not know about, in every metropolis, city, village, hamlet, and cross-roads in the United States. How much was involved? In one western city in which figures were made on this kind of investment, one hundred thousand dollars a year has gone out for the past twelve years from a population of less than ten thousand, and the city has had to pay seven per cent. for the money to buy its waterworks. This city is typical.

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What a Utility Investment Would Have Made

Had the first hundred thousand dollars which went from this city into wild-cat mining been invested in a seven per cent. preferred stock of the utility serving it, and the income actually earned and paid been invested in equally good securities, the hundred thousand dollars would have still been intact, and more than another hundred thousand dollars been added to it as the result of its income.

Had this hundred thousand dollars been invested in the local public utilities, the street car lines, the gas mains, and the electric light and telephone systems might have been extended, the city's area increased, and everybody who invested would have gained a second profit from the increased value of his real estate, or from better and more business, or both.

The political quarrel with the local street railway, because its profits were going to "foreigners," might have been averted, because the people at home would be earning the profits from the service which they enjoyed.

The people who invested in street railways, whose property lay before their doors and carried them to and from work and business; in gas pipes and works, for whose service each householder paid a monthly sum; in electric light plants, for whose service everybody likewise paid a monthly contribution, and in telephone systems into which the local nickels were constantly dropping, could have understood these simple services, their virtues, and their earning power much more readily than they could ever hope to understand quartz mills and rubber tire making and the synclinals and anti-clinals of the geology of petroleum. They could tell on the instant whether their investments were coming good or coming ill and find out why, on the spot and at the time. No long-distance committee visits would have been necessary. They would have been better off, happier, and would have had their money.

The Meaning of Customer Ownership

Customer ownership of public utilities is the name given to a system of investment of the small sums by people who earn their money by the sweat of their faces and can ill afford to lose it, in the utility enterprises which they themselves support, which supply their own needs, and whose fortunes they, as citizens, can themselves help to conserve.

Customer ownership is the opportunity for the saving citizen to invest his money in a business based upon his own necessities.

Customer ownership is an opening for profit by investing in business enterprises, serving the investor under conditions where he can determine day by day whether or not the management knows its business and serves its patrons well.

Customer ownership of public utility securities is a safe outlet for the million annually absorbed by the fly-by-nights, and "take-a-flyers" and the "blue-skys" and other forms of taking a dip into the pot-of-gold at the far end of the rainbow.

It has an individual and a personal side, too, which will be discussed

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further along. But just now let the reader reflect on the truth of this statement, that the money sunk in hopeless speculations in the past ten years, by the small investors of any given American city could have resulted in true public ownership and would have helped to build up the city and surrounding territory.

Customers of Public Utilities Should Own Their Securities

Public utility securities, as opportunities of investment, are the most carefully safeguarded form of investment offered the public.

The public earns and saves ample money for such investments, but that millions of it are, annually, hazarded on "fly-by-nights" and wasted, so far as their original owners are concerned.

What is the logic of customer investment in public utility securities?

The Simple Logic of Customer Investment

The logic of customer investment is very simple. It runs through all the experiences of orderly family life.

Orderly family life, involving husbands and wives, the making and keeping of homes, the raising of families and their education, is the normal basis of all civilization. The bachelors and spinsters constitute so low a percentage that their conditions and relations simply don't count in the big issue.

In the first instance, the family is the occupant of a home, for which it pays rent. Its rental payments afford a profit to the landlord. It is the landlord's customer. As soon as the family manages to produce a surplus it becomes seized with the desire to become an owner of the kind of property for which it pays a profit to some one else.

It desires customer ownership of a home.

It achieves that in time by investing its surplus, all at once if it be large enough, in periodical payments if that be most convenient, in ownership of a home, to be occupied by a customer for homes, a normal family.

A mechanic, skilled at his trade, working faithfully, produces in addition to his wages a profit to the man who employs him. That mechanic is a customer of his employer, buying from him with his work an opportunity to earn his wages. Having a normal American ambition, the mechanic who has saved his money seeks to gain ownership for himself of the opportunity to earn wages, and starts a shop of his own.

He is then the customer of his own opportunity to give employment, and he earns both his old wage and his profit thereupon.

The tenant-farmer, who has the use of his land on a money-rent or shares, combines the early condition of both the house-renter and the mechanic. The farm is both his home and his workshop. His ambition is for customer ownership of both in one.

He puts his surplus into a farm, and becomes the customer owner of both home and opportunity for employment.

In these processes the customer, whether of homes or the opportunity to work, or of farm, puts his surplus into the things which make a profit out of him.

This is customer ownership, and neither he nor the public sees anything

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out of the ordinary about it. In fact, it is the usual mark of thrift and good citizenship.

Home and Shop Owners Buyers of Service

Home-owners and shop-owners are large buyers of the kind of services rendered by public utility companies. This always was the case and always will be.

Whether there is a public utility service available or not home-owners and shop-owners must provide themselves with light, heat, power, transportation and communication.

They may use oil lamps if there is neither gas nor electricity available for light. They may use wood or coal if electric power is not supplied. They may use the horse and buggy, a motor car, or even walk, if street car service is not installed. They may have to run their own errands or use a messenger or the mail if a telephone service is not organized.

But where these facilities are provided in a modern way the people pay a great deal of money for their services, because they use a lot of them.

These services involve the investment of capital to provide them, just as the landlord must invest for the renter, the shop-owner for the wage-earner, and the land-owner for the tenant farmer. That capital must earn a living and it can only earn it out of its customers. These people must give the capital its profit, just as they did the landlord, the shop-owner, and the land-owner. And they can earn their share of that profit for themselves by buying their share of the capital investment in the utility that serves them.

The same rule that leads to home investment, starting one's own business or buying one's farm, leads to customer ownership of utilities.

It is the rule that it is well for the family and the business man to get back as much as they can of the profit that they create by paying for their own needs. It is the same rule that leads people to buy shares in the banks in which they deposit, or from which they borrow money.

Opportunities for Customer Ownership

The opportunities for customer ownership of public utilities are quite as frequent as those of home buying or of starting in business for one's self. The companies are doing business in the customer's own city, are serving him his domestic gas, his heat, his light, his power, and his communication. As a rule, he knows whether they are profitable or not. At any rate, he can find out by asking any business man of average information.

He can buy interests in them in small amounts when he is saving his money.

He can today buy a single share of preferred stock for a single hundred dollars, and get a return of from six to eight per cent. a year on it. He can to-day buy some first mortgage bonds in hundred dollar denominations, returning him six or seven per cent. a year. He can to-day buy bonds in five hundred and thousand dollar values, and have the same security and the same returns per dollar that the very rich and large investors get per dollar on their investments in the same kind of securities.

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The public utilities are the most democratic investments on earth. Rich man, middle man, and comparatively poor man get exactly the same returns and the same security, and they all contribute toward the profits which come back to them, because the public utilities sell the services which everybody must have.

Money That Might Otherwise Be Wasted

The beauty of these transactions is that the money that buys such investments is the very same kind of money and the very same money that is being charmed away from its owners by the "fly-by-nights."

It is the very same money that the gold-mine promoter and the over-hopeful oil-field developer are trying to get people to put into their ventures.

It is the very same money that is promised the fifty and hundred per cent. returns in these adventures that never come, but which can earn six to eight per cent. a year and be kept safe.

The reason that it isn't safe in the others is because interests in gold mines and oil wells and town-promoting factories are not customer ownership, are not backed up by the necessities of the investors. Public utility investments are safe because the investors are themselves furnishing the business that makes the profits.

It's the Same Capital That Might Have Been Wasted

He who passes by the far-off gold mine and puts his money into his electric light and power company, or his gas company, or the telephone plant or the street railway, may miss the chance to dream of getting rich quickly, but he also misses the likelihood of waking from his dream and facing the stern reality of loss. He gains the assurance that a hundred dollars, properly invested in the utilities this month, will be a hundred and eight dollars next January, a hundred and seventeen dollars two years from now, a hundred and twenty-six dollars in three years, and so on, and that he can sell his investment, almost any day, on the open market, if he really needs the money for something else.

Besides his own profit he will be contributing to community growth and the prosperity of himself and his fellow-citizens, and in some directions he will be aiding in the development of the natural resources and established business of the country, for the public utilities are the most potent influences in the development of the nation's resources.

The Public Utilities Develop the Resources of Nature

The public utilities have done more for the development of America's natural resources than have any other of the instruments of civilization. In developing the bounties of nature they have brought them to the service of the whole people, with a certainty and economy impossible under any other organization.

Every form of public utility has contributed to such development.

By such contributions they have fixed their places in the scheme of civilization, from which no serious-minded person wishes to dislodge them.

The Place of Utilities in the Scheme of Living

To appreciate what the public utilities do for the people, one must go back to the condition which existed before they began to function.

Before modern gas service was available—and that really within the last thirty years—household fuel was either wood or coal, involving, even under the best conditions, storages of fuel, wasteful consumption in domestic units, the disposal of debris, and much unpleasant labor. Lighting as accomplished was done by oil lamps or by domestic gas wastefully used, both sources of light producing unsatisfactory results.

Before city and suburban electric railways, frequent and regular inter-urban transportation was unknown. Local transportation depended upon animal power, was slow and uncomfortable and car capacity was limited.

Before the telephone the service of the messenger was required for every important errand that could not wait for the mail, and social life existed in terms that we cannot now conceive.

Before the Electric Light and Power Co. high-grade illumination was known, power had to be provided in single units for each application, and when distributed through the factory half of it was wasted in turning shafts, pulleys and belts between the engine-room and the work-bench.

The power of the falling waters was allowed to waste, except for so much of it as turned the wheels of country flour-mills or woodland saw-mills.

Natural Bounties Developed by Utilities

Most people think of the bounties of nature in terms of water-powers, or timber lots, or coal mines. That is because we have been longest used to consideration of these. But there are others.

The gas companies, under modern practice, developed the extraction of all the heat that there is in coal. Far from all the heat had been gathered from the domestic use of coal. In addition they saved the ammonia liquor for eventual use in the arts and in the fertilization of the fields, and the coal tar, from which hundreds of chemical products, useful in industry,

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social life and science, are obtained to-day as commonplaces. The bounties of nature included strange earths and clays whose incandescence gave brilliant light. The gasmakers searched these out. The coal supplies had hidden in them the qualities and usefulness of the vegetable and animal life of countless ages gone by. The gasmakers unlocked these storehouses and made them available for the people of to-day, in their arts, their sciences and their lives.

The electric railway made available for living great areas in cities which theretofore had been too distant from sources of employment. In their suburban development they made it possible for city workers to have homes close to the soil. They made the beauties of the fields and the woods available to every city dweller for a pittance. They made the delivery of food products into cities frequent and certain. The electric railways have done more to develop the dairy industry of the United States than any other single factor.

The Electric Light and Power Company took advantage of the hidden mysteries of magnetism in producing power in a form in which it could be made in a single centre, carried on wires, distributed by wholesale or retail, and kept instantly available for service on demand. Under the electric system the cost of power begins when it is utilized and ends when the need is completed. There are no hours of firing in advance of work and no beds of heated coals to be wasted after the days of work are done.

The Electric Light and Power Station's fires never go out. At every minute of the day and night somebody wants light and power in some place. These plants do not waste coal. They get out of it all the heat and power there is in it.

These are among the bounties of nature which the public utilities distribute to the whole people, without waste. And then comes the power of the falling waters, which was running to waste before it was applied to the production of electric energy and its distribution to the people.

Sources of Water-Power; Its Unfailing Supply

City folks don't know much about the power of the falling waters, in spite of all that has been said and printed about it.

Roughly speaking, wherever there is a normal rainfall, a cubic foot of water runs off to the water-courses every second, from every square mile of territory drained by the brooks and the rivers. The rest of the rainfall is absorbed by the earth or evaporated by the sun and the winds.

This water all finds its way to the seas downhill, following the grades of the valleys, be they steep or gradual. It has force enough to remove the barriers to its progress, whether they be logs, trees, rocks, or river banks. This force can be measured and is measured. Roughly speaking again, the fall of a cubic foot of water per second through eleven feet of distance produces energy equivalent to one horse power. If a thousand cubic feet of water a second fall eleven feet, energy equivalent to a thousand horsepower is produced.

The energy produced by this falling water can be husbanded and used by interposing an artificial barrier to it, and directing its fall against

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wheels—turbines they are called—which transform its energy into motive power.

This motive power used to be applied exclusively to work on the spot, like the flouring-mill and the lumber-mill.

By applying it to the production of electric energy, the results of its work may be conducted to places of use a hundred miles away with very little loss.

Formerly electric power couldn't be conducted so far. Then electric light and power stations were operated wholly by steam power derived from coal. When electric long-distance transmission was perfected, the companies already had large markets provided for electric power. This power cost the central stations, good and bad, an average of four pounds of coal an hour for each horse-power of energy produced. That meant that if the falling waters were harnessed to turbines, and they in turn to electric generators, every horse-power of energy in the falling waters was worth four pounds of coal per hour, ninety-six pounds for every day, about thirty-five thousand pounds for every year, or about seventeen and a half tons of coal per annum.

The development of water-power means the saving of seventeen and a half tons of coal per year for every horse-power produced. It means the distribution of power to places where the use of coal would be very costly. It means the supplying of power to conditions where coal could hardly be used. It means, in effect, for every water-power developed, the finding of the equivalent of a new coal supply without the necessity of operating a mine to take it out or the building of a railroad to carry it to market.

In place of the mine and the railroad the development of water-power calls for the construction of a barrier to hold back the water and one to direct its energy against machines which produce a form of motion that can be used to operate electric generators, whose resultant energy may be sent over wires through the countryside, to the cities and villages to turn their machines, to light their streets, to operate their car lines, to supply their laboratories, to pump their water; to run their domestic washing machines and sad irons, and dish washers and refrigerators; to operate the elevators of apartment houses and the coffee mills and meat slicers of the grocers and the meat merchants; to curl milady's hair in the boudoir and to be the servant of the surgeon on the operating table; to furnish the light which fixes the image in the photographer's camera, and to be transformed into the X-rays which enable the medical man to search out the abnormalities and defects of the human system—to do the thousands of things to which electric energy has already been applied, and the thousands more to which its use will surely be adapted.

It is even being used in the mining of the coal which is its competitor as a source of power.

Water-power and electric production have been married to each other and taken a family name unto themselves. They are now called Hydro-electric operations, a very descriptive name, indeed.

The water-power possibilities of the United States have scarcely been scratched, great as have been the developments up to date.

The field for the investment of capital in them is still very great.

The demand for their production is very insistent.

THE PUBLIC UTILITIES DEVELOP RESOURCES OF NATURE

They furnish a practical, permanent and profitable field for the investment of money. Besides that, such investment performs a valuable social function, because, as we shall see, the development of the bounties of nature by the public utilities is an addition to the useful wealth of the nation.

Subjecting the Water Powers to Industrial Uses

The water powers of the United States are curiously distributed.

More than half of them, measured in terms of horse power, occur in portions of the country in which coal and petroleum, the nation's other resources of fuel for power, are not present.

The public utilities furnish the basis for hope of the eventual development of most of the hydro-electric resources of the country, because the utilities have the organization and the plant facilities for distributing them to the whole people.

The conservation of the stored energy fuels of the country will only be possible through hydro-electric developments.

Distribution of Water Power and Fuel Supplies

Save for their applications to the production of heat for domestic comfort, the coal and petroleum supplies of the nation are used and useful for the production of power.

Power is the moving spring of industry. Without power industry cannot exist. Until steam was applied to the production of power modern industry was not organized.

The fuel resources of the country, however great they may be, have their limit. In the production of power whatever portion of them is used is destroyed for good and all. Coal and petroleum do not grow by day. It has taken ages to produce in raw fuel form what is consumed in an hour.

For every horsepower of energy produced without the consumption of fuel a given, definite quantity of fuel is conserved for the future.

The power of the falling waters is the only form of energy which may be used over and over again. At another time and for another purpose the present writer describes the ever-recurring cycle of usefulness of the falling waters in the following words:

"From that day when the world was young and the glacier had ploughed its way across prehistoric continent and uncharted sea, leaving in its wake the forms of the mountains and the hills and the receding levels of the valleys, the waters of the earth have run down to the lakes and the oceans. And from that other day when the winds were loosened and set free the watery vapors have torn themselves from the seas and climbed to the clouds on ladders of sunlight, to be carried back as snows to their mountains or to fall again as rains upon their valleys.

"Day in and day out, year in and year out, come season or season go, the endless round of the movement of the waters of the earth has gone on and on again, from snowdrift to shower; from rainfall to seepage of field and fen into brook and rivulet; from river flow to lake and ocean, and from these again to raincloud, to be burst by the lightning or made crystalline by the cold.

SUBJECTING THE WATER POWERS TO INDUSTRIAL USES

Forces of the Water Powers Never Lost or Diminished

"They are never lost, never consumed, never diminished in volume, never permanently transformed. All the waters of the earth that ever were are still some place in nature, in the moisture of the surface, in the rain-cloud, in the damp of the air, in the snow and the rain, in the water course and in the sea that is open and that which is closed.

"They have their moods, too, these waters of the earth. They purr and whisper through meadow, foam merrily over boulder, rush madly through river, and in their seas give the poet his license to declare that "Man marks the earth with ruin; his control

Ends with thy shore;

Upon the watery plain the wrecks are all thy deeds."

"They are jealous of their liberties, and as they tumble waywardly from level high to level low, they put beside them or capture and carry as their prisoners the sands, the rocks, the forests that stand in their way, and bid them restrain their hurry or change their courses. For the waters are not gentle when their liberties are restrained, and the limit of their power is the only limit of their resistance. He who seeks to drive them must make his harness safe and strong, else they will run away with both him and it.

The Taming of the Flood to the Service of Man

"This power of the waters was not made to be idly wasted. Man, whose great ancestor had tamed the fire and set it to do his work, was not to be balked by the wayward strength of the flood. He learned to hold it with leash and thong, builded for it a treadmill fashioned after its kind, and whispered to it to do his useful work, to grind his food, to turn his looms, to cut the trees of the forest into useful shapes, and to make the page upon which he recorded his transactions and his deeds. As he learned more of the other forces of nature, he whispered to the flood again that he had new work for it to do; that he would harness it in a new way and make it turn the wheels from which he might draw the lightning, that he had already tamed to do his work.

"Man has made the flood his galley slave, to serve him as it rushes from hilltop to sea, and when its work is done he releases it on a brief furlough of idleness, content to let the sunlight and the winds be its warders, to bring it back and set it to work again."

Water Power Development as Important as Coal Mining

The civilization that has been built upon coal and petroleum will be maintained by the power of the waters. In America hydro-electricity has taken its place side by side with carbo-electricity.

The industrial organization that seeks out and mines the coal measures of the hillsides and the deep veins, and that drills into the bowels of the earth to find the petroleum sands and pools, would be recreant to itself were it to neglect the development of water powers.

That civilization has made a fair start on the reduction of the water powers to the purposes of men. The present annual production of hydro-

SUBJECTING THE WATER POWERS TO INDUSTRIAL USES

electricity represents the equivalent of 40,000,000 tons of coal, all of it saved for the needs of the future. The whole consumption of coal for steam and electric power is 400,000,000 tons.

The water power resources of the country so far developed are, roughly, 10 per cent. of what is available. There is enough undeveloped water power in the country to-day to take the place of nearly every ton of coal consumed purely for power purposes.

The development of this vast natural resource is almost wholly the field of the public utilities. The lighting and power service of cities, the operation of car lines, possible great developments in domestic heating and cookery, the reduction of minerals from their ores, the heat treatments of metals for the various purposes of industry, the countless processes of electro-chemistry; these are the fields in which that power will find its uses.

These fields of human endeavor are cultivated most actively in cities.

The development and distribution of this energy through American cities is the subject matter of the operations of the electric utilities.

Looking into the future, one thing seems certain, and that the future of industry in American cities depends largely upon the development and distribution of hydro-electric energy by the public utilities.

"Harnessing the Mississippi"

300,000 horsepower water-power at Keokuk, Iowa, serving electric power to a 200-mile territory

The Money Values of American Water Powers

There has been some discussion of the development of natural resources that lie ahead of the public utilities of the United States. The foremost natural resource available for development in the United States is water-power. The money values of the undeveloped water-powers of the United States are enormous. Their development will call for hundreds of millions of capital. Much of that capital must be secured by public utility companies, and the reasonableness of their appeal must be understood by the public.

Endless Supply of Power from Falling Waters

There is no waste of the waters. They fall, roll on to the rivers and the seas, are evaporated by sun and wind and return to the clouds to fall again and do their work all over.

For every square mile of territory drained by American rivers an average of a cubic foot of water runs off per second throughout the year.

Every cubic foot of water which falls eleven feet represents energy equal to one horse-power. This is as true when this energy is allowed to run to waste as when it is developed and applied to the business of making power.

The development of water-power is the process of applying this energy to machines which turn it into motion, to be again reapplied directly to turning the wheels of industry or to the production of electric energy.

The direct application of water-power to industry limits its use to the locality of its production. Its transformation into electric energy enables it to be transmitted and put to work at great distances from the source of power. These distances are constantly increasing with the development of the art. In Norway and Sweden power transmission for hundreds of miles has lately been accomplished.

Water-power, unlike coal, is never destructively consumed. A developed water-power represents a constant supply of energy, which can be made to take the place of similar energy produced from coal or petroleum, which are actually destroyed in their transformation into power.

A comparison of the amount of coal required to produce a given amount of power will give a true idea of the money value of water-power.

Coal Equivalents of Water

To produce one horse power of energy in the average steam plant calls for the burning of four pounds of coal per hour.

There are more economical ways of burning coal which reduce the consumption of coal to two and a half pounds of coal per hour, but they are in use only in the business of the wise and the wealthy, who know enough and have money enough to install them.

THE MONEY VALUES OF AMERICAN WATER POWERS

The largest percentage of the power made in the United States is produced by the comparatively poor and the careless, who pay for both conditions by burning coal wastefully.

Therefore the four pounds an hour average per horse-power can be safely adopted.

Let us take, for an example, a developed water-power in actual operation in this country, of a rated capacity of 50,000 horse-power. A year's records show that it produced 140,000,000 kilowatt hours of electric energy. Were this power to have been produced by coal consumption, it would have taken 560,000,000 pounds of coal to do this work, or 280,000 tons in the year.

The miners work an average of 200 days in the year. This amount of coal would have taken all the capacity of a mine producing 1,400 tons each working day. Miners, taking the help by and large, produce four tons of coal a day per man. This 1,400-ton daily capacity, equal to the work of the water-power, would have called for all the productivity of 350 men engaged in mining coal.

Loaded on cars of average capacity of 40 tons each, this quantity of coal represents 35 carloads daily. The movement of this coal to its destination is accomplished at the rate of 20 miles per day. Each day a mine producing this amount of coal must be supplied with 35 empty cars to carry its output away. Their average employment of time with a single load to destination and return to the mine is 30 days.

Thus a supply of more than one thousand cars per day is required to keep in constant supply the coal equivalent of this particular water-power. To move them calls for the full time of twelve railroad locomotives, and twenty-four railroad crews, besides part of the time of men engaged in switching, railroad maintenance, recording, superintendence and what not.

The mere unloading of this amount of coal calls for the work of seventy men, or the mechanical equivalent of their labor, which costs capital to install, and money to operate; while the actual firing of the boilers under which it is consumed calls for the work of as many more men, or its mechanical equivalent, which costs more money.

The quantity of coal necessary to produce the power equivalent of this particular water-power development which has been cited would require, from its original place in the mine to the grate-bars of the furnaces in which it might be consumed the labor of two-thirds of a thousand men.

Economic Saving Accomplished by Water Power

The operation of producing the same effectiveness in water-power, in distributing it to its points of use, takes the work of less than one hundred men, uses no coal, no coal cars, occupies no miles of railroad tracks, takes the time of no train crews, railroad operators, coal miners, unloaders or firemen, and saves the cost of all these operators and operations.

Moreover, as water-power is never destroyed and recurs in all its vigor constantly, this saving, once accomplished, is perpetual. And the coal that is economized remains in the economic treasury of the nation, to be drawn upon in the future.

The development of power is the foundation stone of cities and civiliza-

THE MONEY VALUES OF AMERICAN WATER POWERS

tion. The progress of development of cheap power is the barometer of the growth of industry and cheapened production for the people.

Following that growth comes the growth of every other form of public service, of the use of the steam railroad and electric railway for carriage of men and things; of the use of the telephone and telegraph for communication; of the use of town gas for cheap and convenient domestic and industrial heat, and of the use of electric energy itself for the purposes of the household, the shop and the factory.

There is, in the development of the potential water-power of the United States, an opportunity for the creation of new wealth, greater in amount than all that has been extracted from all the gold mines of the United States, and exceeding in quantity the wealth that has been drawn from the diamond mines of Kimberly and Jaegersfontein.

The creation of this wealth, based on the achievement of economies resulting from water-power development, is the field of public utilities, which must look to the investing public, from time to time, for the necessary capital. When the public comes to measure the possibilities of such investment its guiding thought should be that water-power is the only natural resource that can be developed and consumed without depleting the available supply in nature.

The Economic Values of the Water-Powers

The development of the natural resources of the country is peculiarly the field of the public utilities.

Among the greatest of the natural resources of the nation is the power contained in the falling waters of the rivers and streams, the development of which involves the conservation and use of great economic values.

The prosperity of the nation must be perpetual. No good American, however optimistic, could do his work for his country were he to feel that some day, however far off, its prosperity must cease because the nation had used up all its power resources and industry must stop.

The power resources of the nation are its coal and oil supplies, as they are developed to-day or as they may be discovered hereafter. The known power resources of coal and oil and such as may be discovered in the storehouses of the earth in the future have taken geological eras to produce in the laboratories of nature. They are consumed with vastly greater speed in the laboratories of modern industry, commonly called shops and factories.

Scientists already calculate the period during which the world will have a coal supply. They are already warning the world about a possible exhaustion of the oil supply. They may be wrong in the *periods of years* which they calculate. They cannot be wrong in their conclusion that a *fixed supply of anything*, which is being consumed with constantly accelerating demand, *must some day be exhausted*.

Water-Power Resources Present Day Equivalents of Coal Consumption

The potential water-power resources of the United States, so far as they have been surveyed, are equal to furnishing all the power that is produced in this country by the use of coal. Four hundred million tons of coal is consumed annually to produce power.

The developed water-powers of the nation produce power whose equivalent would cost forty million tons of coal. Roughly, a tenth of the power now produced is produced by water-power, conserving, roughly, again, a tenth of the annual demand for coal which would exist if there were no water-powers. The power resources of the American rivers and streams are ten times the capacity so far developed. Were all the surveyed water-powers of the United States now developed and their energy applicable in all the places where coal is consumed, there would be little need for coal.

This will never be exactly the case, but the comparison shows the value of the water-powers in conserving the coal resources of the nation and lengthening the period of the industrial civilization which the world now knows.

THE ECONOMIC VALUES OF THE WATER-POWERS

Distribution of Water-Power in Areas That Have No Coal

The federal authorities who attend to the collection of information on such things have collected figures to show that the greatest opportunities for the development of water-power exist where coal does not occur. These statistical and economic researches prove that the economic value of the water-powers lies in the saving of the coal reserves, the relief of the transportation systems from the carriage of an amount of coal equivalent to their power possibilities, and the establishment of industrial centres in locations at which the consumption of coal is costly and uneconomical.

The Industrial Value of the Water-Powers

The Federal Power Commission reports that it has applications for 16,826,000 horsepower of hydro-electric development. The commission considers it a "very conservative" estimate that each horsepower of developed energy, used industrially, means the employment of one more skilled worker. These, in turn, call for the occupation of many other workers, skilled and unskilled, employed in feeder and consuming industries.

The development of American water-powers means the opportunity for employment for many millions of workers. How these opportunities work out is an interesting observation.

In a western water-power territory electric energy amounting to 60,000 horsepower was installed for a supply of electric energy to two great cities a hundred miles away. The watersheds of these powers included a great area which had once been the scene of an enormous lumber industry. That business had disappeared. The villages and towns were in the doldrums and decaying. They had access to the new sources of energy. Forthwith there sprang up a host of small industries. The turning lathe for wood products came into immediate and general use. A territory that had sold most of its maple timber at \$20 per 1,000 feet began to work up the remnant and the new growth into finished wood products representing \$1,000 per 1,000 feet of maple in its raw state. The difference was the price of power, the wages paid and the profits to the locality. Basswood that had been formerly sold at \$15 a thousand feet began to produce \$800 per 1,000 feet in the form of baseball bats. White pine that was worth, in the days of timber slaughter, \$10 per 1,000 feet was turned into butter making utensils worth \$2,000 for every thousand feet of lumber contained in them.

Electrically-Operated Cottage Industries

The electric light and power industry is building dams and installing electric machinery in hundreds of places.

The development of hydro-electric energy in the United States spells the creation of rural and cottage industries in the United States that will make those of Germany before the war look like experiments.

In the Appalachian watershed, generally in the southland of America south of the Ohio river and east of the Mississippi, 750,000 electrical horsepower have been taken up and put into service in the past twenty-five years. The use of this energy has created cotton spinning and weaving

THE ECONOMIC VALUES OF THE WATER-POWERS

mills in the Carolinas, employing populations that never before got a decent living, even from agriculture. The social result has been better homes, better living, better dressing and a demand upon every other section of the country producing these creature comforts.

Field and Work of the Utilities and Their Capital

These instances are only a few. They are duplicated or duplicable all over the country. They represent the opportunity for the creation of new wealth and the conservation of present resources.

The vision to use them is already in the minds of managers of public utilities.

They represent the future of the growth of these public servants.

Their development calls for and will call for millions of capital, which the utilities are now seeking, or will be in the future.

They represent permanent additions to the wealth of the country, without depletion of its capital, as happens when timber is cut, coal mined, or the precious or useful metals are taken from their hidden places in the earth.

The demand for the capital which is to turn these inert values into useful and usable wealth must be supplied by the utilities which convert and distribute them, and from the capital resources of American investors.

When they are called upon to furnish new money, from time to time, for such operations they may do it with the full assurance that capital invested through public utility organizations in the development of the power resources of the United States creates the only new and permanent wealth obtainable from the natural resources of the country.

The Demand for Public Utility Service and for New Capital to Provide It

The parable of this discussion of the public utility services of the United States concerns their usefulness and the permanency of demand for them. This demand is asserting itself now with marked distinctness; and the early future promises to make it more intense.

There was never a condition in the United States in which there was so great a demand impending for additional service from the public utility companies. The reason for that is that we slackened our progress in construction for domestic purposes and our demand for creature comfort when we began to devote ourselves to war necessities construction in 1914, and when we redoubled our efforts in 1917 there was even less activity in this direction.

Now, the country is crying loudly for new housing. In every city in the United States there is a shortage of houses. In every city, capital is being canvassed for investment in building. This year and next year promise to be important in the history of American construction.

Where do the public utilities come in on this?

The minute a contractor pitches his tent or his cabin on a new building site he has to have a telephone. The moment he installs his plant he has to have a hoist operated by electricity. His workers hurrying to and from their tasks make new lanes for urban transportation, distinct from those which existed before, calling for added car service. The modern type of contractors are installing power machinery on their new projects to cut and dress wood finish, to manipulate metals, to apply paints and dressings, to polish fireproof floors. The labor of the mechanic is being supplemented by more and more mechanical devices daily. This means a demand for more electric energy.

Demands of Newly Completed Structures

As these structures are completed and occupied they make new demands for the service of the utilities. The people who inhabit them must have street railway service to and from their homes and offices. The new structures that are homes for the people must have gas-cooking and hot-water appliances in every apartment. Light is uniformly supplied by electricity. Every suite is potentially the customer of a new telephone. The elevators must be operated by electric current. Milady's curling-iron in her boudoir must be heated from the electric outlet. The coffee-percolator and the toaster on the breakfast table call for more current. Even the doorbell, which used to be operated by a dry battery, is nowadays connected through a transformer with the public electric supply.

The basement laundry is equipped with washing-machines calling for the use of both electricity and gas to operate and heat them. The familiar ironing machine for the flat-work, and the new-fangled one which will iron the master's collars, are additional claimants for the service

Modern Electrical Appliances

and some of the

**Comforts and Conveniences that May Be Enjoyed
from Their Use in the Home**

□ □

VACUUM CLEANER

Keeps the house clean. Removes dirt and dust from floors, rugs, draperies, bedding and clothing *and takes it out of the house*. Does not scatter dust in the rooms. Quick, convenient and easy to operate. An economical labor saver.

MILK WARMER

Heats baby's milk to just the right degree in a few minutes.

HOT WATER CUP

Has many practical uses where boiling water is required. Pint or quart capacity.

HAIR DRYER

Makes the hair dry, soft and fluffy in a few minutes. Hot or cold blasts.

CURLING IRON HEATER

Heats the iron just right. Clean and safe.

VIBRATOR

A wonderful vitalizer. Stimulates circulation. Attachments for various needs.

MODERN ELECTRICAL APPLIANCES

HEATING PAD

Holds even heat. Different temperatures available. Flexible. Invaluable for use in sickroom or sleeping porch.

GLOW RADIATOR

Very useful in the bathroom and nursery for quickly taking off the chill.

CURLING IRON and DRYING COMB

Even heat as long as desired for curling. Gives drying heat without injury to the hair.

PERCOLATOR

One of the most popular of Electric favorites. Makes excellent clear coffee, free from grounds, in a few minutes.

TOASTER

The best method of making toast at the table. Clean, economical, always ready for use.

CHAFING DISH

Many delicious and staple dishes may be prepared, quickly and conveniently. Its practical, everyday uses are many.

MODERN ELECTRICAL APPLIANCES

GRILL

Will cook a small dinner or luncheon on the dining table. Will broil, fry, toast, boil and stew, or perform any two of these operations at the same time. Quick in results and convenient.

HOT PLATE

A useful miniature stove. No smoke, odor or dirt.

SAMOVAR

Makes excellent tea. A great favorite with the modern hostess.

FAN

Cools in summer and ventilates in winter. Useful in every room.

IMMERSION HEATER

Especially valuable for quickly heating a small quantity of water for shaving or the sickroom.

PORTABLE STOVE and OVEN

A practical stove and oven for cooking a complete meal.

MODERN ELECTRICAL APPLIANCES

BUFFING MOTOR

Ideal for polishing silver, sharpening knives and grinding. Attachments for various uses.

IRON

Irons delicate laces or the heaviest pieces perfectly. No heated room, no lost energy, no wasted fuel. Holds even heat as long as desired.

SEWING MACHINE MOTOR

There are now available complete Electric Sewing Machines, or your present machine may be modernized by motor attachment.

WASHING MACHINE

An Electric Washer makes washing a mechanical achievement instead of a physical task—conserves the energy and increases the efficiency of servants. Washes the clothes clean. A great time and money saver.

MODERN ELECTRICAL APPLIANCES

DISC STOVE

Performs all functions of any small stove. No heat in the room.

FIRELESS COOKER

Cooks a complete dinner with little attention. Economical, convenient.

RANGE

All cooking may be done with the Electric Range — easily, comfortably and efficiently. Concentrates the heat where it is required. No wasted heat. Ready for use at all times. No dirt, dust, smoke or fumes.

DEMAND FOR PUBLIC UTILITY SERVICE AND NEW CAPITAL

derived from the electric central station and the distilling benches of the gas works.

Already refrigeration by power-driven ice-machines has made its appearance in apartment buildings, as it long ago did in separate homes. Tomorrow, refrigeration from central sources of supply in apartment houses will be a commonplace. It is already an experiment. The vacuum cleaner is an institution. The motor-driven phonograph is a fixture.

Community Calls for New Public Utility Services

The community calls for new supplies of public utility service are multiplying day by day. The philosophic cobbler of yesteryear, who sat on his bench day in and day out, who lasted and talked, and pegged and talked, sewed and talked, and burnished and talked, has passed away, and his manual art with him. Any decent fellow who can rent a shop and pay his rent for it can get a shoe machinery outfit, hitch an electric motor to it, and quadruple the cobbler's outfit.

All these likely youngsters who start garages and do repairs depend upon the electric service to furnish them power and the gas supply to give them industrial heating facilities. The chain grocer turns his customer's pound of roasted coffee into a machine and grinds it by electric power. The big old fly-wheel of the coffee-grinder and the grocer's sore shoulder have been replaced by a motor a little bigger than the grocer's two fists.

In the hotel kitchen the dishes are washed by electric power and the "spuds" and the apples peeled by machines driven by motors. In the cigar store the lighter is made to glow by the magic of electric current. The domestic furnace has its waves of hot air sped onward by a fan fixed in its heating outlet. The "self-winding" clocks that keep even time throughout factories, stores and downtown districts of cities have their mainsprings in the big generators of the central stations nowadays, instead of in their own "innards."

Solid Fuels and Isolated Power Plants Are Passing

Solid fuels for domestic purposes and isolated power plants are passing out where they were, and are not coming in where they have not been before. Modern economics, the high value of space in cities, the desire for cleanliness in operations, the eventual economy are all conspiring against them. In whole sections of American cities to-day not a fire is lighted from year's end to year's end for heating purposes. Central heating by steam and hot water has become a by-product of volume-generation of electricity. And the ventilation is done by electrically operated machines.

There is more connected horsepower in the garages and cobbling shops of the United States to-day—all electric—than there was in the mills and factories of New England in 1890.

There are more hot water heating radiators which derive their heat from a gas supply operating in the United States to-day than there were of all kinds of radiators, steam and hot water, in the United States in 1870.

DEMAND FOR PUBLIC UTILITY SERVICE AND NEW CAPITAL

There are more gas-heating appliances used south of Mason and Dixon's line in the cities of the South to-day than there are of any other kind of fuel-consuming devices in the same places. And their use is extending into the suburban areas.

We are just in the infancy of long-distance gas transmission. In England gas is supplied for sixty miles by high-pressure systems. In the United States there are several such examples to-day. There will be more. With them has already come delivery of gas to suburban and agricultural homes. We have some of it now. With them will come delivery of gas to little communities which cannot themselves support gas works. We have some of that now, too.

Two strangely antagonistic reasons are forcing new demands for public utility services. The one is the apparent determination of people to live in congested groups. These people must have such services. The other is the determination of people to live in suburban areas. They must have these services, too, or, like Mr. Dooley's friend, Mr. Hennessy, they will not be content to live in the country, where all the good things come from, but will sigh for the flesh-pots of the city, where all the good things go to.

Demands for Services of All Public Utilities

These new buildings and the old and the people who are to inhabit them or do so now are calling more loudly year by year for the services of the public utilities. If people live in separate homes they want them for comfort. If they are packed away in tenements or abide in apartments they must have them to make the most of high rental spaces. If they live in suburbs they demand them to keep themselves in even comfort with them who live in the cities.

Every new development of American housing is laying a new burden on the city and suburban street railway systems, on the gas-producing and distributing organizations, on the central supplies for electric energy, and on the central heating systems.

And besides, every one of the new homes, apartments, villas, stores, shops and factories must have a telephone, just as naturally as it must have a key to the lock of the front door. The day of borrowing the use of one's neighbor's telephone long since passed away, and one can have a phone of his very own for very little more than he pays at the public pay station, and one's friends can call him up; so "what's the use of being without it?" Flippant, perhaps, but that's the way the demand for the telephone grows.

The New Capital That Is Called for by Public Utility Extensions

All this is part of the progressive growth of America. Before American cities and the countryside call for new city halls, new community houses, new theatres, and even new schools, the urge is for more houses and better ones, which in turn call for the service of the electric car, electric power and light, the gas supply, and the telephone, the handmaiden of communication.

DEMAND FOR PUBLIC UTILITY SERVICE AND NEW CAPITAL

To supply them is going to take an immensity of new capital, which must be assembled by appeals to the public, which owns all the capital there is and which is constantly accumulating more.

How great the capital sum must be, where it will come from, what arguments will charm it into such investments, will be discussed later. Meantime let it be remembered that the demand for public utility services in the United States in the immediate future is going to call for an immense amount of new capital, which may be safely and profitably invested in them.

The Money Needed for Public Utilities and Where It Will All Come From

With the rejuvenation of business and the reorganization of industry a deal of new capital is going to be called for by the public utilities.

They are the clearing houses in which the public demands for community service and the capital and maintenance expenditures required for these demands meet each other and establish the requirements for new investment and rates necessary to attract and maintain them.

The Call for New Money

There are five billions of dollars invested in electric street railways in the United States. There is more than a billion—a good deal more than a billion—invested in the telephone business. There are more than two billions of actual value in the gas plants and mains. There are three billions in the electric light and power business in present true values. These foot up eleven billions of dollars, and this sum means little more than the total of bonds and preferred stocks issued against the properties.

The normal demands for new capital for extensions of these properties alone are, to put them very low, five per cent. per year, or five hundred and fifty millions of dollars. In periods like that of 1911-1920, when cities grew immensely with the intensification of industry, the normal demand for extension was ten per cent. of the already invested capital. That demand was not satisfied. It has accumulated and is pressing for its satisfaction.

Meantime there are new opportunities for developing public utilities to the profit of the investor and the service of the public.

There have already been filed with the national government applications for water-power leases for more than a million horsepower, now undeveloped. At the low cost of one hundred dollars per horsepower this will take another hundred million dollars; not this year, maybe, but pretty soon.

We are all reading about the competing offers to develop Muscle Shoals, the same great natural resource. Whoever is entrusted with the development will face a final expenditure of more than Five Hundred Million Dollars before the potential powers of the Tennessee and its tributaries are harnessed and made the servants of industry.

Pressure That Comes from Growth of Cities

The cities of the United States hold to-day thirty-five per cent. of the population. They contain eight millions of the homes of the nation. They are clamoring for more homes. All manner of financing is proposed to build them. Part of the pressure is indicated in the soldiers'

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bonus proposals to provide Government aid to ex-soldiers to build and own homes. Every new home means a new customer for gas, for electric light and power, for the street railway and the telephone. Every new customer for each of these means a new demand for capital for the public utilities to put in the new service, to supply the new demand, to increase the capacity of the power houses and the gas plants, to buy new cars, to make new gas lines and electric conductors and tracks, and to put up more telephone wires and install new telephone instruments. More public service plant; always more public service plant.

New methods of doing business, new processes of industry, new applications of power and heat and communication are increasing the per capita demand upon the utilities. What has been illustrated is the increase of the numerical demands, the number of customers. But the per capita demand from the customers increases, too. Years ago the consumption of sugar in the United States was about twenty pounds a year for every man, woman and child residing therein. Now it is about ninety pounds apiece each year. The use of public utility services grows in about the same way. Take your own case. When did you add the extension telephone to your kitchen or bedroom, or both? When did you buy the electric flat-iron, the toaster, the washing-machine and the mangle? When did you discover the beauties of the countryside and begin to use the interurban railway to take you and the family to the seashore, or the wild flowers and the countryside? When did you dispose of the old gas plate and put in the new range with the warming oven? When did you install the hot water heater and the garbage burner? Each of these, one by one, has increased the per capita demand for the services of the public utilities.

Proper Development Would Take a Billion a Year

The proper development of the capacity and the extension of distribution of the public utilities would justify the investment of a billion dollars a year for some years to come. That investment would earn an honest return on itself by adding to the productivity, the convenience and the economies of the American people so much more than an income on the capital involved that they would get a handsome income as well.

Time and energy are the two most valuable raw materials used in America to-day. Wood and stone and iron and steel are "pikers" when compared with them in value.

The public utilities make time and energy go farther than any known efficiency process has extended the usefulness of the others.

So long as this condition continues, the demand for new service from the public utilities must continue and with it the demand for new capital to give the service.

Where Is All the New Money to Come From?

Where is all the new money for the public utilities to come from, this new half billion or billion a year?

First of all, part of it is going to come from the places where it has

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come from before. It is going to come from the conservative investor, the banks, the estates that must keep their money safely and lucratively invested, the insurance companies, the sinking funds organized to pay debts, the endowments of colleges and universities which must have regular returns to pay their professors and carry their students, the hospitals and charities which must invest the moneys given them by the benevolent to provide for the perpetuation of good deeds and kindly works; even from the cemetery associations which must gain interest on the funds handed them for the perpetual care of the last resting-places of the dead. These are the largest holders of public utility securities to-day, and will be the buyers of the future, providing part of the needed capital.

The rest of it will come from the people, grown sensible, who have been chasing the pot of gold at the foot of the rainbow to make their fortunes in a minute. As a fortune maker nothing has been discovered yet that beats old Mr. Simple Interest unless it be his relative, old Mr. Compound Interest.

The rest of it will come from the people who have been dumping their hundred millions a year into the bucket shops which the authorities hereabouts have been shaking up lately.

It will come from the people who have been putting their money into the schemes of Mr. Ponzi in Boston and his imitators in Chicago and other places.

It will come from the people in the little town in Michigan, with a population of two thousand, which uncovered half a million of losses the other day in "fake" stock purchases, and all the other little towns of two thousand and upward whose people secretly or openly "invest" and lose as much proportionally every year.

It is surprising how great a sum is dumped into these sink holes every year—eighty millions in bucket shops in New York, ten millions in Ponzi's Boston scheme, ten millions more in the adventures of his Chicago imitators, hundreds of millions in the aggregate from the little and the big foolishnesses into which people's money is charmed.

Eight per cent. investments double their principal in less than ten years, seven per cent. investments in a little more, six per cent. investments in twelve years. Investments in public utilities are always THERE.

There is enough capital frittered away every year in this country in the hope of making speedy fortunes to provide for all the public utility development that the country demands annually.

The people who have that money can find opportunities for investment, in great sums or small, in these handmaids of civilization.

They can always be sure of an annual return upon it, and they will not have to go to the district attorney to discover its abiding place, six months after they have parted with it.

The people have the investment wealth of the United States. As "fly-by-night" or "get-rich-quick" or "blue sky" are offered them, this thought is pertinent, that there is enough money lost in idle speculation in the United States every year to provide for the largest schemes of public utility developments, which will add to industrial capacity and the national wealth.

The Demand for Public Utility Service Is Only on Its Beginning

There has been a slump in business in the United States since the close of the World War.

The productive capacity of the country had been speeded up to meet the demands of destruction, added to those already arising from consumption.

Normal consumption in the United States did not grow appreciably during the war period. The resources of the country were being husbanded for the national interest. Meat products, sugar, gasoline, coal, steel, copper, wool, were among the subjects of "rationing."

Business is coming back. Reduced consumption has ceased to be enforced. Normal consumption is returning. With it the demand for the service of the public utilities.

Coming Decade Foreshadows Great Public Utility Demands

For ten years there has been a sub-normal increase in the supply of public utility facilities. Capital has not been fully available since 1914. Materials were not in supply during the war period. Labor was depleted by the organization of armies and its remnant was overworked on war necessities. The utilities were hindered. Electric light and power companies couldn't get deliveries of new machines to care for increasing loads. The Government took the toll out of the gas supply.

To-day it is different. The armies are dispersed. The nation's material supplies are at disposal of consumption. Labor is eager for employment. Capital is available. The industrial train is running uphill. The people are moving to and from work. The bank clearings are increasing. The debts have been liquidated. There is money enough available not only for the national needs, but for foreign states. The investors are willing to put their money with safe and profitable enterprises.

Already the demand upon public utility services is showing increase. The next decade promises to offer a greater demand for public utility service and public utility capital than has ever been shown before. The public already has the facts. It simply hasn't related them.

A Hundred Millions for Telephones—How Much More?

Already a single industry, centralized in management so that its capital demands are impressive, has made its call upon the money market. A hundred millions have been provided for the telephone industry. All over the country telephone managements are laying out budgets to provide for five years, that advantage may be taken, so far as possible, of present prices and manufacturing conditions.

That hundred millions will carry the industry not more than three years, so far as new capital demands are concerned. Twice more, at least within the next decade, will an equal amount of new capital be called for.

DEMAND FOR PUBLIC UTILITY SERVICE ONLY BEGINNING

Meantime the telephone art is improving. In many parts of the country automatic and semi-automatic types are being installed or planned for. That means more capital. The automatic intercommunicating private exchange is going into factories, stores, government buildings and the like as fast as it can be supplied. More capital again, to provide more trunk lines, more conduits, more cables, more central office apparatus

The telephone industry will be a candidate for millions of capital.

Gas Industry's Demand for Capital

Half of the homes now existing in American cities were built before 1880. That means that their design did not contemplate what has come to be the modern usefulness of gas fuels. When they were built gas was used only for illumination in open burners. The reader who looks around for an open burner to-day will find it only in the livery stable and the blacksmith shop. Incandescent gas mantles are the rule. The modernly built home provides for the use of gas in the hot water heater, the washing-machine, the range, the hot plate. In the modern factory gas and oil are the competitive fuels for heat treatment of metals.

Coke as a fuel, the by-product of gas making, is being urged as one of the results of the campaigns against the smoke nuisance in cities. Those campaigns are only in their infancy.

Fifty-Fifty

On this archaic line, in the outskirts of Denver, a horse pulled the car up hill and then rode down on the rear platform. He was on the job so long that his shoes wore grooves in the flooring.

DEMAND FOR PUBLIC UTILITY SERVICE ONLY BEGINNING

The demands for the establishment of an American dye industry are insistent upon the chemical contents of the by-products of gas making.

The processes incident to the making of heavy chemicals, such as soda-ash and caustics, call for the constituents of coal liberated by gas-producing operations.

The rebuilding of American city homes, the abolition of slums, mean more gas uses.

The supply of gas to small places by high-pressure service from central points is only in its infancy. In England gas is sent through pipes to points sixty miles from the source of its production. There is potential use in American villages, now unserved, for an added half as much gas as is already produced for the cities.

The demand for service is coming so gradually that even the gas managers, supplying it piecemeal, do not look on it as a revolution. But it is constantly demanding more capital, and as constantly paying a fair return for such capital.

The Surface Car and Its Big Brother

The surface car has had a hard time for a few years back. Costs of operation have increased. Rates have been advanced. The volume of business has sometimes decreased as a reaction. But it still remains true that the total income of the surface lines has kept up to nine hundred millions a year. That kind of a business must increase. The demand for more surface car line service is manifesting itself all over the country. Lines are being lengthened a little. New cars of greater capacity and lessened operating cost are being built and sold.

Modern Street-car and Trailer

Rapid transit, involving exclusive rights of way which cannot be supplied on the surfaces of streets, is being more or less practically discussed in every American city of over half a million. The end of that story, too, is more capital, more money for lines, cars and power-producing machinery.

DEMAND FOR PUBLIC UTILITY SERVICE ONLY BEGINNING

Calls Upon the Sources of Electric Supply

The electric light and power industry is confronted with the great task of heading the procession of national industrial development. This industry must raise more than three-quarters of a billion dollars a year for water-power development, more steam plants and extensions to industries, homes and farms.

More than 1,000,000 new residential light and power customers were placed on the lines of the electric light and power industry during the year 1921, making a total of approximately 9,000,000 residential electric light and power customers served. Millions of homes, farms and industries will ultimately receive the great benefits of electricity and the electrical industry must be ready to answer the demands of the public for service.

More than 1,600,000 thrifty American citizens own the electric light and power companies of the United States. The electric light and power companies are taking their customers into partnership in a great national movement for greater Customer Ownership. Hundreds of thousands of the customers of the electric light and power companies are now buying sound electric light and power company securities.

The entire electrical industry stands ready to serve the American people. The savings and capital of millions of citizens are required for the great electrical program immediately ahead. Sympathetic understanding on the part of the people and new capital wisely invested by thrifty Americans will ultimately bring the benefits of electricity to home, farm and industry.

Modern Electric Interurban Street-car

As Civilization Grows Use of Utility Service Grows

As civilization grows the use of public utility services must grow. Civilization is growing all the time. Rome was, because it had the Aqueduct

for its water supply, the Appian Way for its road and the Cloaca Maxima for its great sewer, pretty good examples of public utilities for their time. New England became a cotton mill area because the water powers were developed early and the factories set down beside them. Minneapolis became the wheat-grinding centre of the United States because its pioneers harnessed the Falls of St. Anthony and built flouring mills alongside them.

Science and mechanics have made it possible to transmit the power of these natural resources a hundred miles. The possibilities of the water powers have scarcely been invaded. Their invasion will cost as much as the invasion of Belgium, only the capital will be more wisely applied.

And then we are just on the eve of an era of new power stations set hard by the coal mines, to burn coal at the pit mouth, send its energy over wires, and relieve the railroads of much of their burden. One practical plant for this purpose is working in Pennsylvania. The capital has already been supplied for another in Indiana. The future has more of these examples in its bosom.

The Utilities Answer Economic Demands

The increase of central supplies of power, of economic fuel, of communication and of transportation—which mean electricity, gas, telephones and street railways—is necessary because they go with better living, greater domestic economy, the aggregation of people in centres of industry, the saving of time and energy, and all the other things that go with increased consumption and increased production.

So long as the public mind is directed toward these things there must be more public utility service. So long as the public wants them and pays for them they will be supplied. So long as they must be supplied they will continue to be a permanent, inviting and profitable field for capital. And they are going to call for a lot of it. The public owes it to itself to be ready to supply it. The theorem on which its demand is based is that

So long as Cities Continue to Grow in the United States, Industries to Thrive, and the People to demand Economical Advances in Living Conditions, the Public Utilities Must Grow, Must Have Capital to Create and Enlarge them, and Will Pay a Return on that Capital.

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